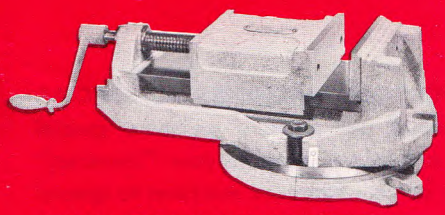
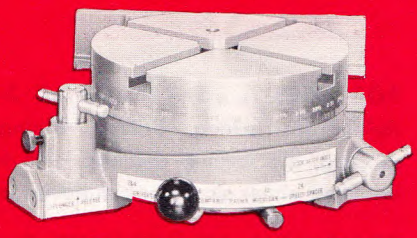
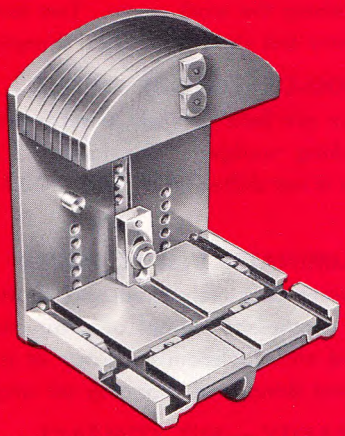
10 ways to make set-ups easier-quicker



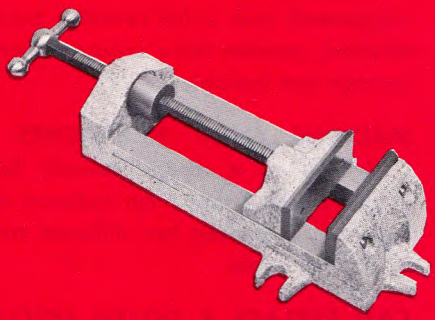
LOW-BOY MACHINE VISES
PAGE 13



SPEEDI-SPACER PAGES 5 & 6



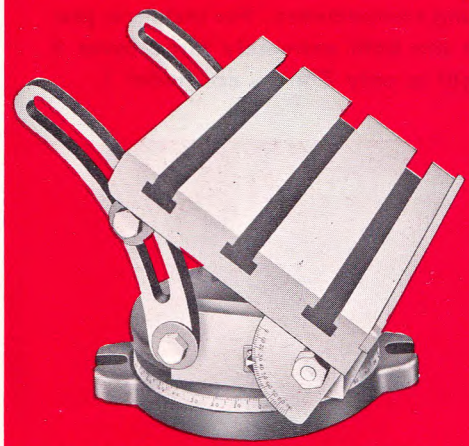
PRECISION ADJUSTABLE
LATHE FIXTURES PAGE 7



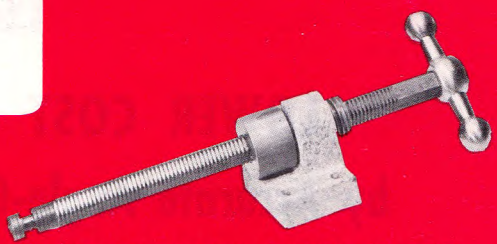
QUICK ACTING VISES PAGE 11

CLAMP-N-JACK
SET-UP SYSTEM
PAGES
14 THRU 21

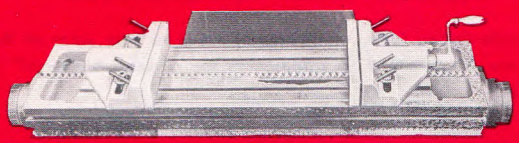
3-WAY VISES PAGES 1 & 2



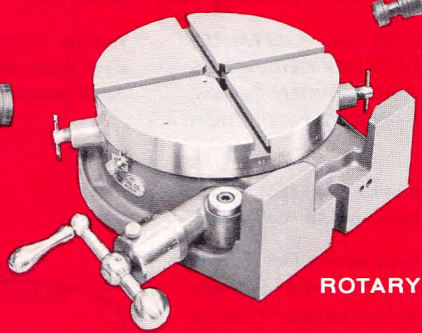
ADJUSTABLE ANGLE PLATES
PAGE 10



QUICK ACTING PRESSURE UNIT
PAGE 12



MILL VISES PAGE 9



ROTARY TABLES PAGES 3 & 4

UNIVERSAL VISE & TOOL COMPANY PARMA, MICHIGAN

With a "UNIVERSAL" You Can Machine Any Angle

101 USES . . . The "Universal" 3-Way Vise holds work rigidly for milling, drilling, boring, reaming, grinding, shaping, die sinking, checking — in fact for any operation involving either single or compound angles.

COMPOUND ADJUSTMENTS QUICK, EASY . . . The most complicated compound angles can be set quickly and easily. Double swivel cradles (each allowing 90-deg. adjustment), over a full swiveling base (allowing 360-deg. rotation), provide three separate motions, individually adjustable and lockable.

MACHINE SHOP HEADACHES CURED . . . The "Universal" is a specific remedy for many a headache in your machine shop. For instance, drilling a "cockeyed" hole, or . . . making two different cuts when milling a slot at a tricky angle.

CAN REPLACE A DOZEN SPECIAL FIXTURES . . . Ease of setting any complex angle, and interchangeability of jaw plates with your own special plates, make "Universal" an ever-ready fixture for temporary set-ups in short or pre-production runs. Saves time, trouble and expense.

ROUND OR ODD-SHAPED WORK . . . Unusually large jaw opening lets you readily insert your own specially shaped jaw plates for round or odd-shaped work, making the vise in reality an economical, quickly prepared universal fixture.

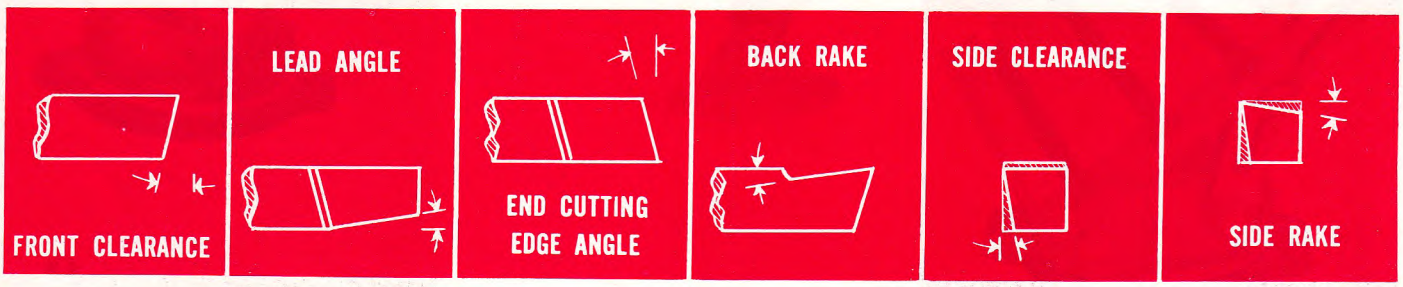
ADAPTS SINGLE-PURPOSE MACHINES TO SPECIAL JOBS . . . If you cannot get delivery on some special machines needed for rush jobs — then use your "Universal" Vise and adapt many of your standard machines to special jobs — in a hurry!

FULLY PORTABLE — WITHOUT RESETTING WORK-PIECE . . . Movable from machine to machine without removing the work or disturbing the work angle. Two large base lugs provide for easy but rigid bolting or clamping.

WEDGE-LOCKS — 2000-LB. TORQUE TESTED . . . The cradles and the base are held securely in set position by long arc-shaped locking wedges. The locking is so positive that jaw position is not shifted even by a 2000-lb. torque load.

EXTRA RIGIDITY — ELIMINATES VISE "CHATTER" . . The "Universal" holds work absolutely rigid and chatter-proof. Any reasonable workpiece weight or production-cut load can be handled with toolroom accuracy at production speeds and without danger of changing set angle.

GREATER WORK CAPACITY — BUT COMPACT . . . The "Universal" is a heavy-duty vise, weighing as much as a third more than comparable units, and providing greater jaw capacity and more adjustments. All without sacrificing compactness. For instance: jaw opening and width are both extremely large (over 5 in.) yet closed height is only 7¾ in. on model 1.



LOWER COST TOOLING — HIGHER PRODUCTION

by Accurate Angle-Grinding of Cutter Rakes and Clearances

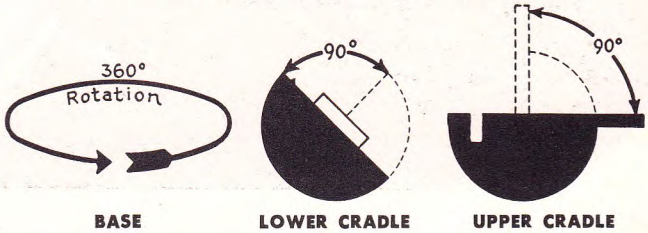
ACCURATE ANGLE-GRINDING OF CUTTER RAKES AND CLEARANCES LETS YOU CUT AT HIGHER SPEEDS, GIVES YOU COARSER FEEDS, HOLDS YOUR TOOL EDGES LONGER, WITH LONGER RUNS BETWEEN GRINDS, HOLDS TOLERANCES FOR LONGER PERIODS — YIELDS PRODUCTION ECONOMIES.

A "Universal" Vise now provides the simplest, most dependable and economical way to accurately machine and grind cutting tool angles!

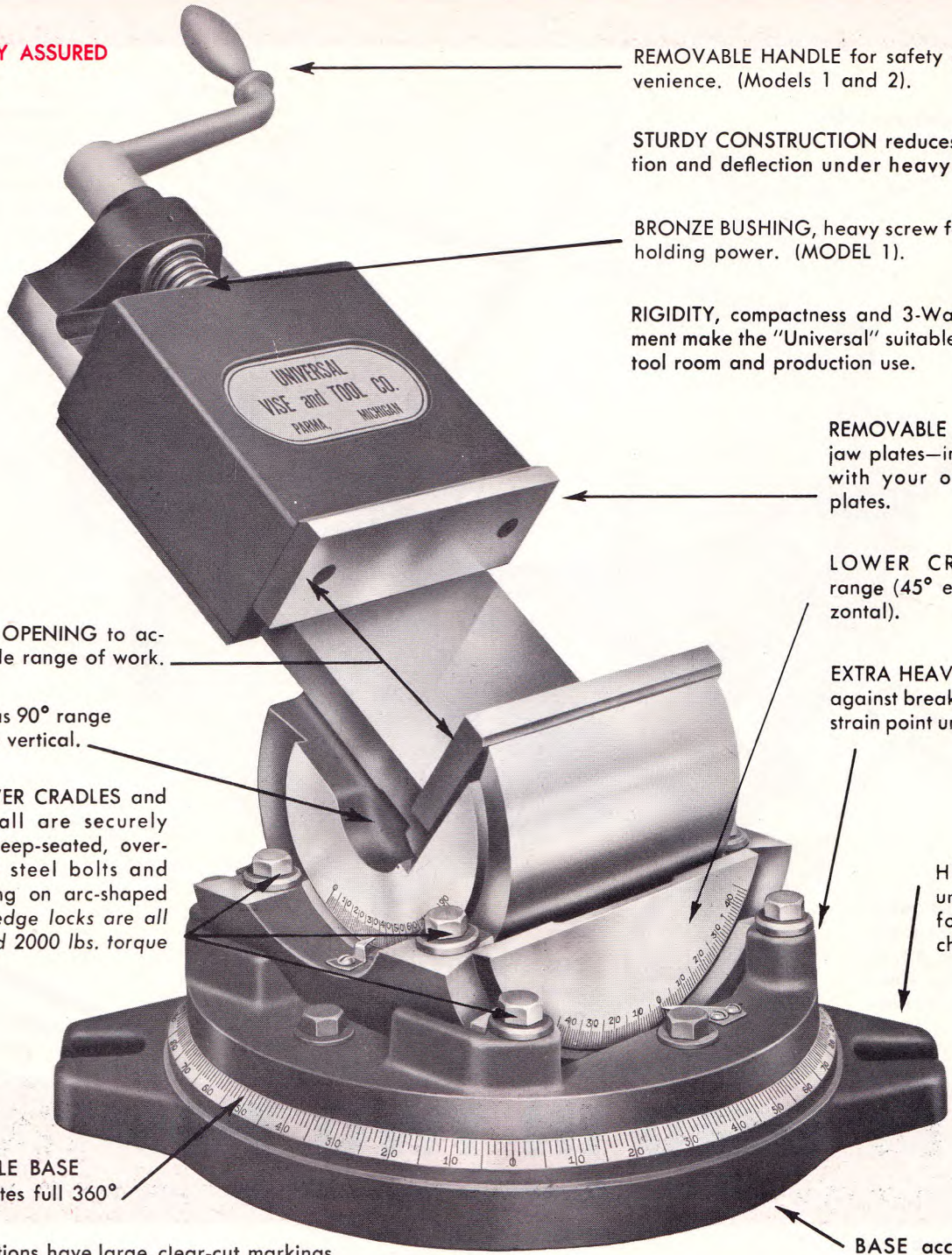
For example — the average high-speed steel lathe turning tool requires six angles ground — front clearance, lead angle, end cutting edge angle, back rake, side rake and side clearance. All six can be ground quickly and accurately in a Universal Vise mounted on a magnetic chuck, **without removing the toolbit from the vise jaws!** And the back and side rake, two most important angles, can be ground at the same time, **on one setting** of "Universal"!

And for carbide-tipped tools, where usually three or four sides of the steel shank are angle-milled in addition to the recess, "Universal" is made to order!

A TRULY UNIVERSAL MACHINE VISE WITH 3 SEPARATE ANGULAR ADJUSTMENTS.



On Any Machine Tool–At Any Simple or Compound Angle



TTING RIGIDITY ASSURED
LL MOVEMENT
LOCKS TESTED
WITH 2000-LB.
TORQUE
LOADING

REMOVABLE HANDLE for safety and convenience. (Models 1 and 2).

STURDY CONSTRUCTION reduces vibration and deflection under heavy loads.

BRONZE BUSHING, heavy screw for added holding power. (MODEL 1).

RIGIDITY, compactness and 3-Way adjustment make the "Universal" suitable for both tool room and production use.

REMOVABLE hardened steel jaw plates—instantly replaced with your own special jaw plates.

LOWER CRADLE has 90° range (45° each side of horizontal).

Extra-large JAW OPENING to accommodate a wide range of work.

EXTRA HEAVY bosses to insure against breakage at maximum strain point under heavy loads.

UPPER CRADLE has 90° range from horizontal to vertical.

UPPER AND LOWER CRADLES and swiveling base all are securely locked by four deep-seated, oversized, hardened steel bolts and flange rings acting on arc-shaped wedges. *These wedge locks are all tested to withstand 2000 lbs. torque load.*

HEAVY LUGS and underface base slots for bolting to machine tools.

TURNTABLE BASE
rotates full 360°

NOTE: All graduations have large, clear-cut markings and are accessibly located for quick, easy reading.

BASE accurately machined —true flat, parallel and squared to the vertical axis.

"UNIVERSAL" 3-WAY VISE SPECIFICATIONS AND PRICES (3 SIZES)

	MODEL 1, Cat. No. 100	MODEL 2, Cat. No. 101	MODEL 3, Cat. No. 102	
HEIGHT (closed)	7¾"	6¼"	4¼"	
HEIGHT (highest position)	18¼"	14"	12"	*grinders*
JAW WIDTH	5¼"	3⅝"	2⅝"	*model —*
JAW OPENING, steel jaws in place	4⅞"	3½"	3¼"	*includes*
Steel jaws removed	5⅞"	4½"	4"	*fitted*
JAW HEIGHT	2"	1¾"	1"	*carrying*
DIAMETER OF BASE	10¾"	9¼"	5¼ sq.	*case*
WEIGHT	80 lbs.	42 lbs.	20 lbs.	
PRICES (F.O.B. Parma, Michigan)	$230.00	$215.00	$205.00	

THE TOOL YOU CAN'T AFFORD TO BE WITHOUT! COMPACT-STURDY-ACCURATE-QUICKLY ADJUSTED

NEW UNIVERSAL ROTARY

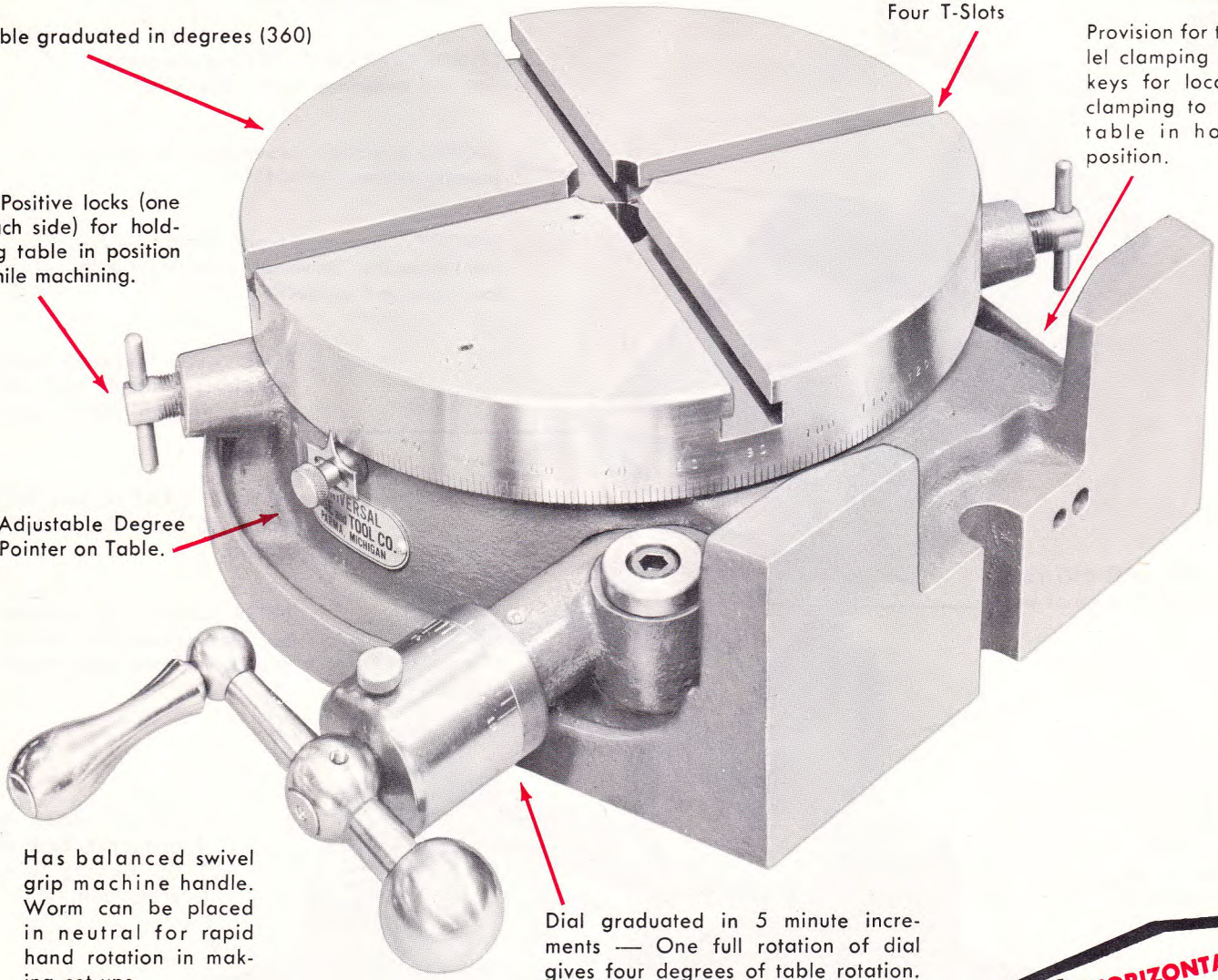
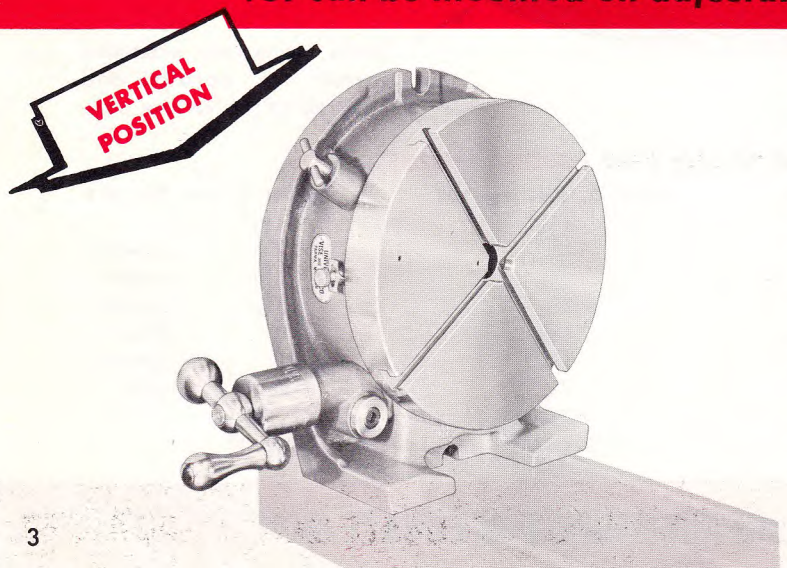


Table graduated in degrees (360)
Four T-Slots
Provision for two parallel clamping dogs and keys for locating and clamping to machine table in horizontal position.
2 Positive locks (one each side) for holding table in position while machining.
Adjustable Degree Pointer on Table.
Has balanced swivel grip machine handle. Worm can be placed in neutral for rapid hand rotation in making set-ups.
Dial graduated in 5 minute increments — One full rotation of dial gives four degrees of table rotation.
HORIZONTAL POSITION

CAN BE USED IN TWO POSITIONS!

(Or can be mounted on adjustable angle plate for angle set-ups)



All working parts machined to tool room standards — table surface, rotation ways and resting surfaces square and true.

Extra low for maximum tool clearance.

Has Ground Lead Screw Worm, precision machined worm gear and rotates on tapered roller bearings.

Built of highest grade semi-steel castings fully normalized and stress relieved.

Four oiling points lubricate all bearings and ways.

Guaranteed Accuracy is as follows —

1. Maximum run-out in center-hole is .001".
2. Maximum parallelism error through 360° rotation of table is .0015".
3. One minute of arc through 360° on 6 inch circle.

TABLE IN THREE SIZES...

ROTARY TABLES WITH STANDARD GRADUATED DIALS

	MODEL RT-9	MODEL RT-12	MODEL RT-15
Overall Height	4"	5⅜"	5⅜"
Overall Length (Right to Left)	11½"	15⅛"	16½"
Overall Width (Front to Back)	12¼"	17⅞"	18¼"
T-Slots	9/16"	9/16"	9/16"
Center Hole Diameter	1⅛"	1⅜"	1⅜"
Table Diameter	9"	12"	15"
Weight Approximate	75#	135#	175#
Vertical distance to table center when in vertical position	6½"	8"	9"
Catalogue Number	142	132	143
PRICE	CAT. No. 142 $215.00 ea.	CAT. No. 132 $305.00 ea.	CAT. No. 143 $335.00 ea.

ROTARY TABLE ACCESSORIES

CATALOG No.	DESCRIPTION	PRICE EACH*
144	Dividing Attachment, for use with RT-12, RT-15	$ 82.00
159	Dividing Attachment, for use with RT-9	82.00
145	Tail Stock Attachment, for use with RT-9	60.00
146	Tail Stock Attachment, for use with RT-12, RT-15	65.00
147	Chuck with Adapter, 4", 3-jaw type	92.00
148	Chuck with Adapter, 6", 3-jaw type	160.00
149	Chuck with Adapter, 8", 3-jaw type	210.00
150	Chuck with Adapter, 10", 3-jaw type	265.00
151	Chuck with Adapter, 12", 3-jaw type	295.00
152	Chuck with Adapter, 4", 6-jaw type	125.00
153	Chuck with Adapter, 6", 6-jaw type	220.00
154	Chuck with Adapter, 8", 6-jaw type	270.00
155	Chuck with Adapter, 10", 6-jaw type	360.00
156	Chuck with Adapter, 12", 6-jaw type	380.00
157	Chuck Adapter Only, blank	22.00
158	Chuck Adapter Only, finished	27.00
161	Adjustable T-Slot Aligning Keys suitable for T-Slot Sizes 13/16"—11/16" and 5/8", for RT-9, RT-12 & RT-15, Set	10.00

*All prices F.O.B. Parma, Michigan and subject to change without notice.

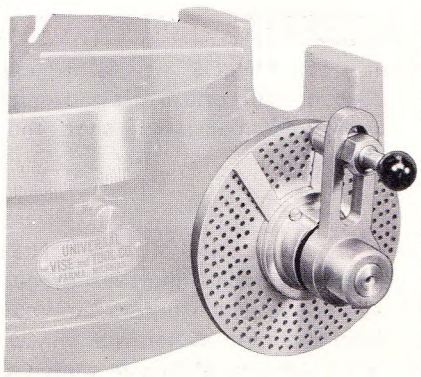
...AND THESE ACCESSORIES!

DIVIDING ATTACHMENT

Divides all numbers from 2 to 63 27 additional divisions through 100 plus many others obtainable by formula.

Cat. No. 159
For use with RT-9

Cat. No. 144
For use with RT-12 and RT-15.

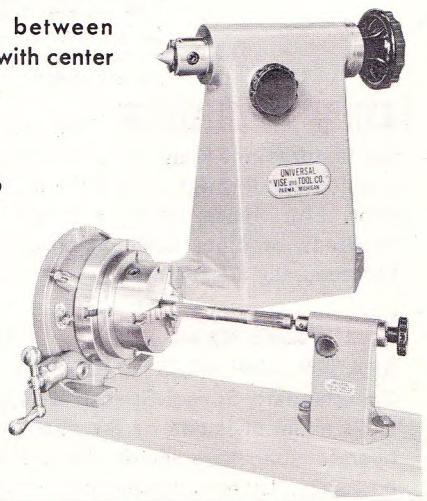


TAIL STOCK ATTACHMENT

For rotary work between centers. Equipped with center height adjustment.

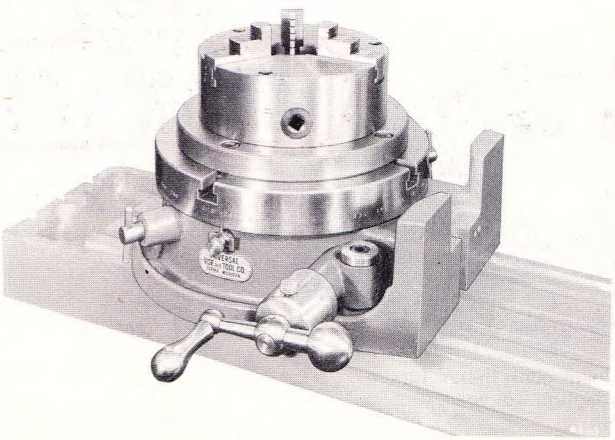
Cat. No. 145
For use with RT-9

Cat. No. 146
For use with RT-12 & RT-15



CHUCKS WITH ADAPTERS

Chuck Size	Fits	Cat. No. 3 Jaw Type	Cat. No. 6 Jaw Type
4"	RT-9, RT-12 & RT-15	147	152
6"	RT-9, RT-12 & RT-15	148	153
8"	RT-9, RT-12 & RT-15	149	154
10"	RT-12 & RT-15	150	155
12"	RT-12 & RT-15	151	156



CHUCK ADAPTERS ONLY

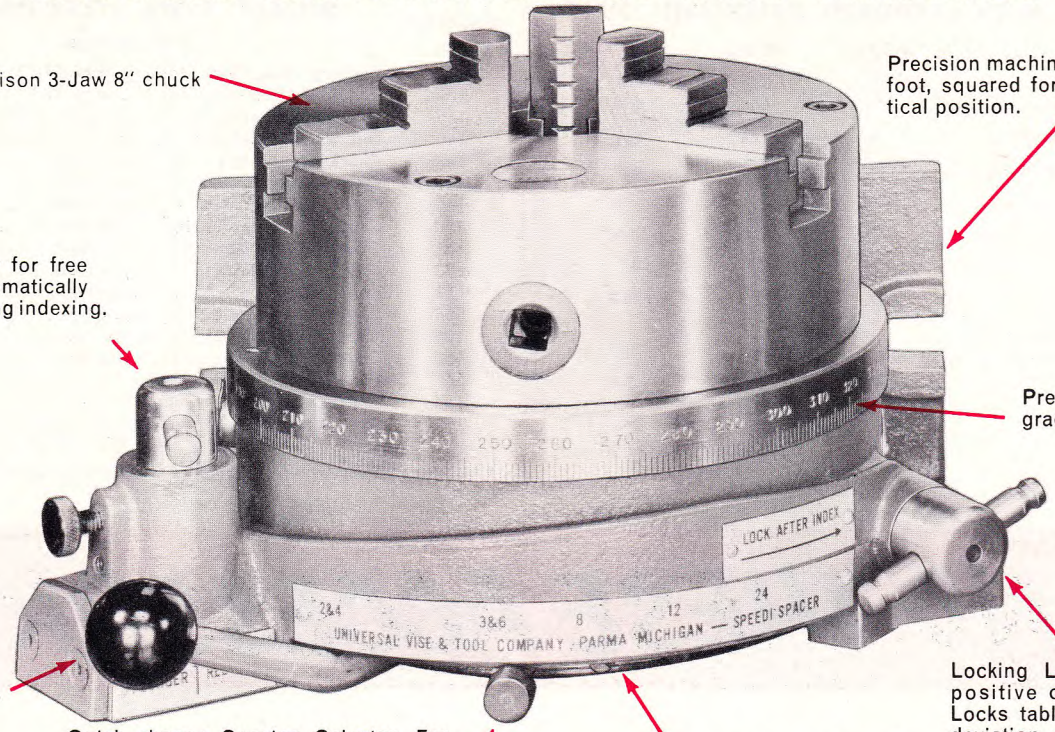
For use with your own chuck. Specify make of chuck, size and diameter of bolt hole circle.

Cat. No. 157
(Blank)

Cat. No. 158
(Finished)

NEW UNIVERSAL SPEEDI-SPACER for.

REDUCES EXPENSIVE JIGS AND FIXTURES


Precison 3-Jaw 8" chuck
Precision machined and ground flat foot, squared for mounting in vertical position.
Release lever for free rotation. Automatically releases during indexing.
Precision degree graduations.
Transfer lever for quick accurate indexing.
Quick change Spacing Selector. For choice of 2, 3, 4, 6, 8, 12 or 24 divisions with no masking plates or blockouts. Other spacing divisions available by simple installation of low cost special master plates.
All working parts sealed and protected from chips and dirt.
Locking Lever — Actuates positive clutch-type lock. Locks table without angular deviation or offset.
LOCK AFTER INDEX
2&4 3&6 8 12 24
UNIVERSAL VISE & TOOL COMPANY · PARMA MICHIGAN — SPEEDI-SPACER

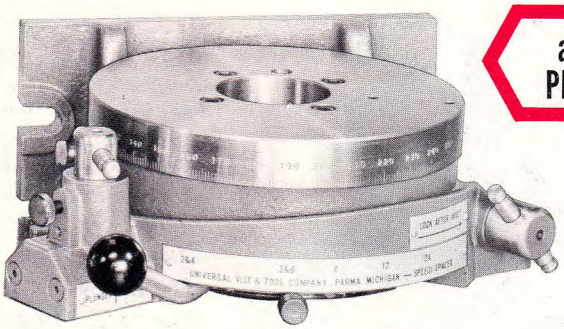
FAST LEVER-ACTION! The new Universal Speedi-Spacer has features not found on any other tool of its type. Spacing is automatic through the simple movement of a single transfer lever. The Spacer locks securely for milling, drilling and hundreds of other common shop applications where speed and accuracy are required.

VERTICAL OR HORIZONTAL The Speedi-Spacer is made in a convenient 9" size to fit most machine tools. It can be used for both vertical and horizontal applications. Two transfer levers are furnished—one short, one long, to fit the requirements of any job.

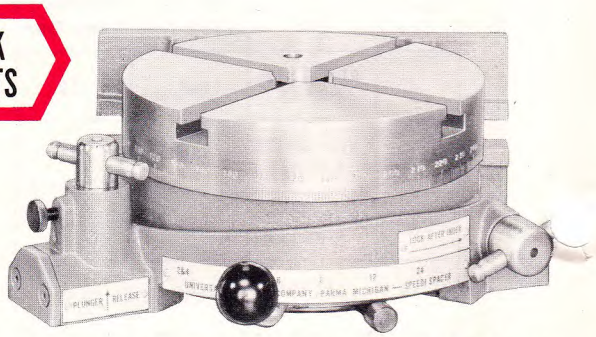
REDUCES TOOLING COSTS! THE UNIVERSAL SPEEDI-SPACER REPLACES EXPENSIVE JIGS AND FIXTURES. The standard Speedi-Spacer is adjustable for 2, 3, 4, 6, 8, 12 or 24 equal divisions by the changing of only one simple-to-operate spacing selector. No masking plates or blockouts necessary. Lever action moves the table from one station to the next smoothly without fumbling or possibility of operator error.

INCREASES EFFICIENCY The quick-acting Speedi-Spacer saves labor and improves production efficiency. It reduces scrap loss which occurs through operator error in indexing from station to station with only visual guides. Speedi-Spacer will index from station to station quickly and accurately.

SPEEDI-SPACER available with 8" CHUCK PLAIN PLATEN, OR T-SLOTS



The Speedi-Spacer with plain platen furnished blank for adapting to your own chuck or sub-fixture.

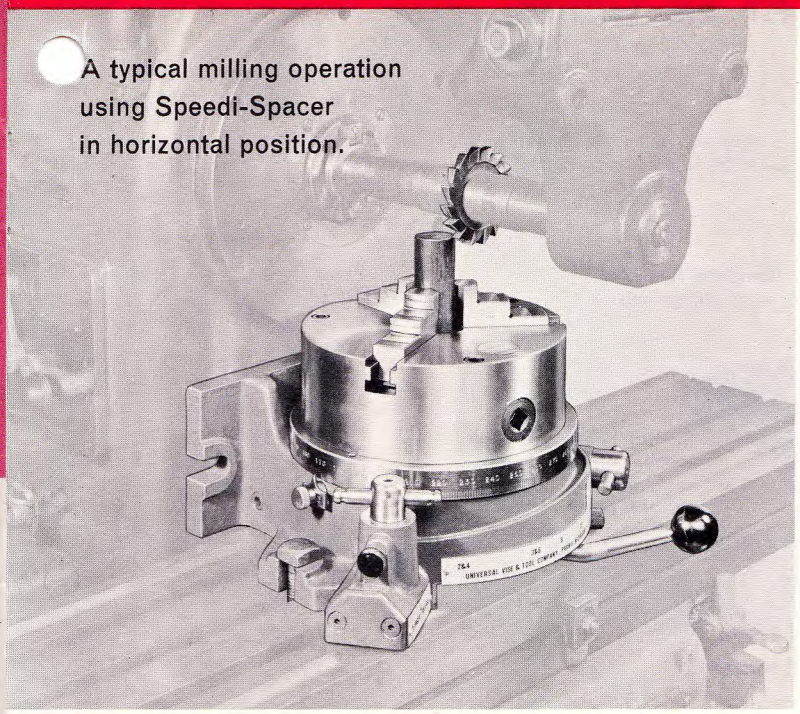


Speedi-Spacer with T-Slotted Platen (9/16" T-Slots).

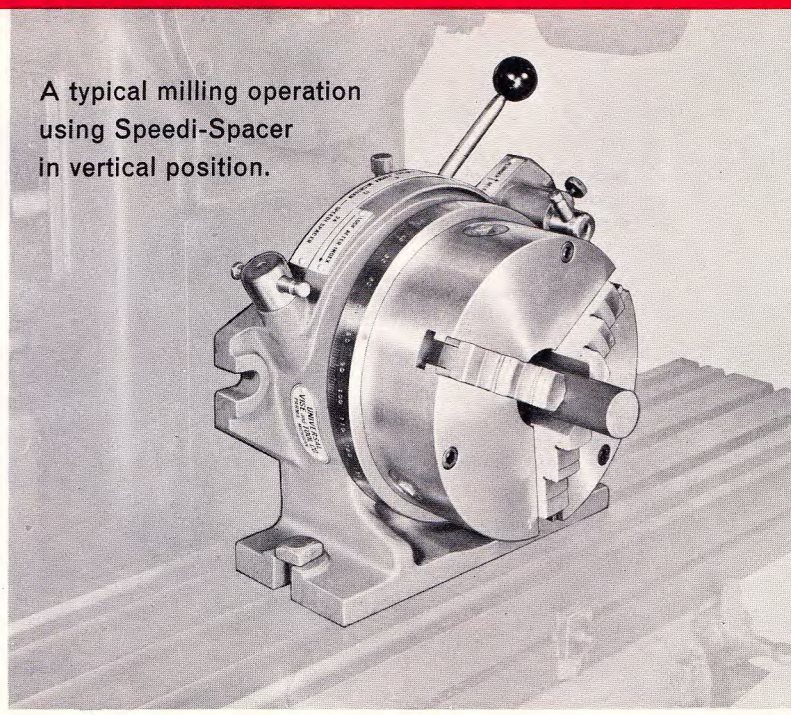
.... QUICK AND ACCURATE SPACING

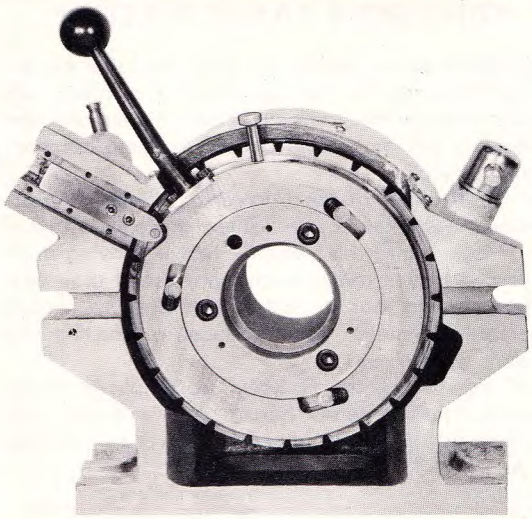
ON PRODUCTION AND IN THE TOOL ROOM

A typical milling operation using Speedi-Spacer in horizontal position.



A typical milling operation using Speedi-Spacer in vertical position.

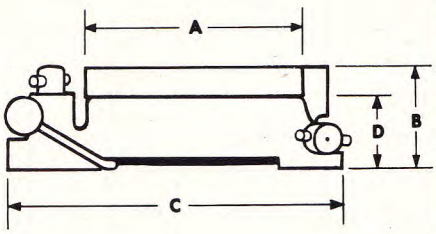


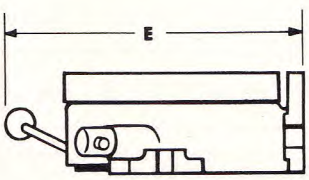


VERSATILE

Speedi-Spacer with protective plate removed shows high-precision master plate and precision cam arrangement.
THE SPEEDI-SPACER IS EFFECTIVELY SEALED AGAINST CHIPS AND DIRT WHEN ASSEMBLED AND IN USE.

SPECIFICATIONS AND PRICES

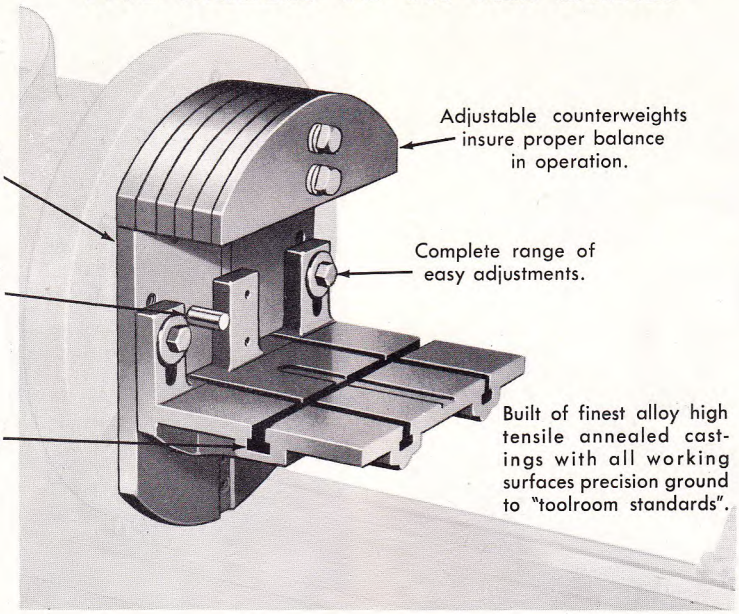




CAT. NO.	DESCRIPTION	A	B	C	D	E	WT.	PRICE
200	Speedi-spacer with T-slot platen for 2, 3, 4, 6, 8, 12 & 24 divisions — with 9/16″ T-slots	9″	4 7/8″	12 3/4″	3″	12″	95#	$450.00
201	Speedi-spacer with plain platen for 2, 3, 4, 6, 8, 12 & 24 divisions	9″	4″	12 3/4″	3″	12″	90#	435.00
202	Speedi-spacer with 8″ 3-jaw universal chuck for 2, 3, 4, 6, 8, 12 & 24 divisions	9″	8 1/8″	12 3/4″	3″	12″	120#	580.00
203	T-slot platen only	9″ DIAMETER Interchangeable with plain platen					20#	95.00
204	plain platen only	9″ DIAMETER Interchangeable with T-slot platen					15#	85.00
205	8″ 3-jaw universal chuck only with two sets of jaws						30#	165.00
206S	Special master plates to perform divisions other than standard	Request quotation advising divisions required.						

INCREASE LATHE PRODUCTION–SAVE TIME–SAVE MONEY

FIVE MODELS TO FIT ALL LATHES


Back centering plug fits into machine face plate insuring accurate centering.
Hardened and ground precision "centerline" locating pin.
Precision T-slots
Adjustable counterweights insure proper balance in operation.
Complete range of easy adjustments.
Built of finest alloy high tensile annealed castings with all working surfaces precision ground to "toolroom standards".

FOR—
Tool Rooms
Production
Maintenance

ON—
Engine Lathes
Turret Lathes
Grinders
Borematics

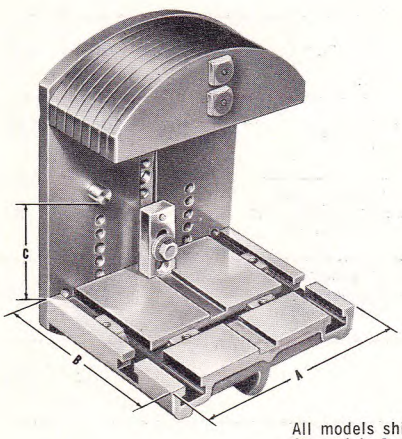
(Model 16 Pictured)

MOUNTING AND SETTING UP THE "UNIVERSAL" PRECISION LATHE FIXTURE

A shallow counterbore is machined in the lathe face plate to receive the fixture back plug and to accurately locate the "Universal" Precision Lathe Fixture on the lathe spindle centerline. (On models 9, 11 and 13 a back plug is made to fit the lathe spindle bore). The "Universal" Precision Lathe Fixture is held securely to the face plate by capscrews inserted through the face plate slots into tapped holes provided. The bottom of the hardened and ground "centerline" locating pin is on the exact centerline of the lathe spindle. By means of this pin and scale readings, calipers or inside micrometers the "Universal" Precision Lathe Fixture can be accurately set vertically. The center keyway in the plate is also on exact lathe centerline and work is located horizontally by readings from this point or from the plate edge. The work or sub-fixture is easily held by the precision T-slots provided. Proper balance in operation is insured by adjusting the counterweights provided. The maximum distance that the fixture plate can be set from the lathe centerline is shown as dimension "C" below. The fixture plates are fully adjustable through this range. Plate dimensions and "centerline" locating pin dimensions are of extreme accuracy insuring precision set-ups.

A few typical applications of the "Universal" Precision Lathe Fixture are shown on the next page. These are only a few of the hundreds of jobs where this versatile tool is proving itself. You will find that it makes lathes much more useful than ever before and lets you do jobs on lathes that used to require expensive special machinery. Your toolroom, production and maintenance costs will be cut.

The "Universal" Precision Lathe Fixture is so simple in design and operation that the "greenest hand" can use it and your experienced machinists will find it a ready answer to hundreds of machining problems.



SPECIFICATIONS AND PRICES

MODEL NUMBER	FITS	DIMENSION "A" WIDTH OF PLATE	DIMENSION "B" LENGTH OF PLATE	DIMENSION "C" Min. and Max. Distance — Fixture Plate Top to Lathe Centerline	APPROXIMATE WEIGHT	Cat. No.	PRICE* EACH
9	9" LATHES AND LARGER	7.250"	6"	0"—2"	27 LBS.	119	$120.00
11	11" LATHES AND LARGER	7.250"	6"	0"—3"	29 LBS.	120	125.00
13	13" LATHES AND LARGER	7.250"	6"	0"—4"	31 LBS.	121	135.00
16 HEAVY DUTY	16" LATHES AND LARGER	12.000"	8"	0"—5½"	115 LBS.	122	275.00
24 HEAVY DUTY	24" LATHES AND LARGER	18.000"	12"	0"—8½"	255 LBS.	123	520.00

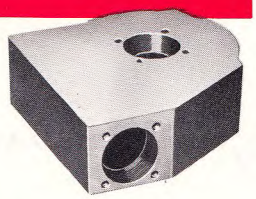
All models shipped equipped with one set of T-slot nuts, set of counterweights and wrench. Models 16 and 24 shipped with back centering plug. On models 9, 11 and 13 back centering plug is quickly turned on your own lathe. *Prices F.O.B. Parma, Mich. and subject to change without notice.

PRODUCT OF **UNIVERSAL VISE & TOOL COMPANY • PARMA, MICHIGAN**

WITH THE NEW "UNIVERSAL" PRECISION LATHE FIXTURE

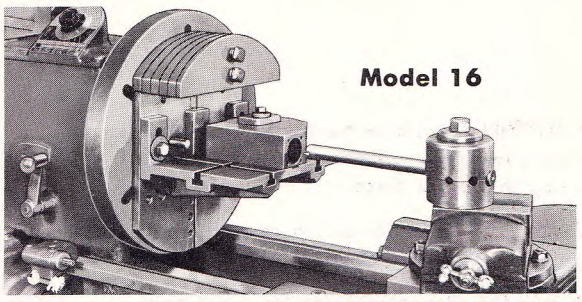
TYPICAL APPLICATIONS

Production Boring



To accurately position and bore a gear case casting.

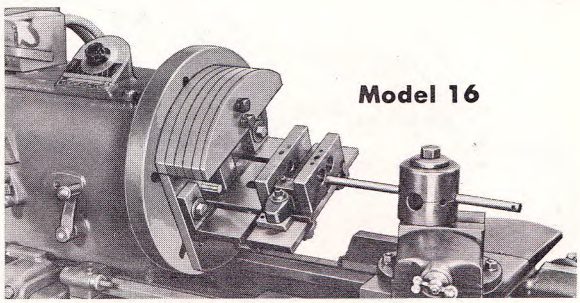
Casting Bored on a "Universal" Precision Lathe Fixture — A perfect substitute for an expensive boring mill.



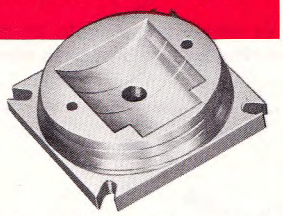
Tool Room

To accurately bore two holes in a drilling fixture.

Both holes accurately located and precision bored on a "Universal" Precision Lathe Fixture.

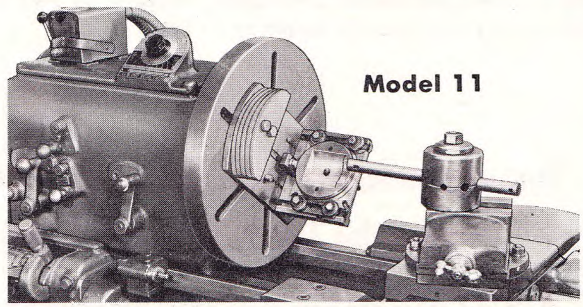


Maintenance Dept.



To accurately machine a radiused recess in a machine part.

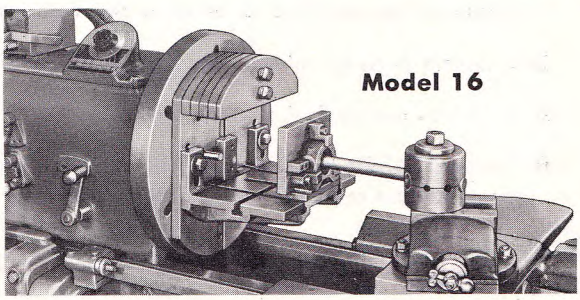
Located, held and precision machined on a "Universal" Precision Lathe Fixture — no special cutters required.



Production

To accurately position and bore a bearing housing.

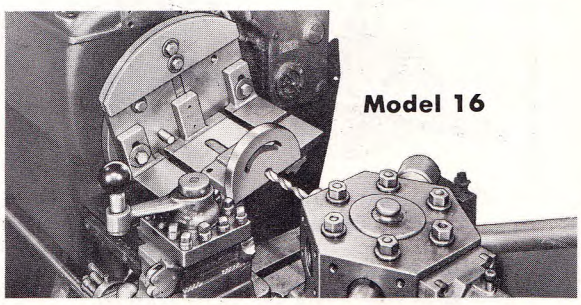
Simple sub-fixture on "Universal" Precision Lathe Fixture cuts tooling costs and increases accurate production.



Turret Lathe Production

To locate, turn, face, center drill, drill and tap a machine casting.

Casting mounted in a simple sub-fixture on "Universal" Precision Lathe Fixture. Production up and tool design and building costs way down.



"UNIVERSAL" TOOLS ARE IN USE IN MORE THAN 10,000 PLANTS

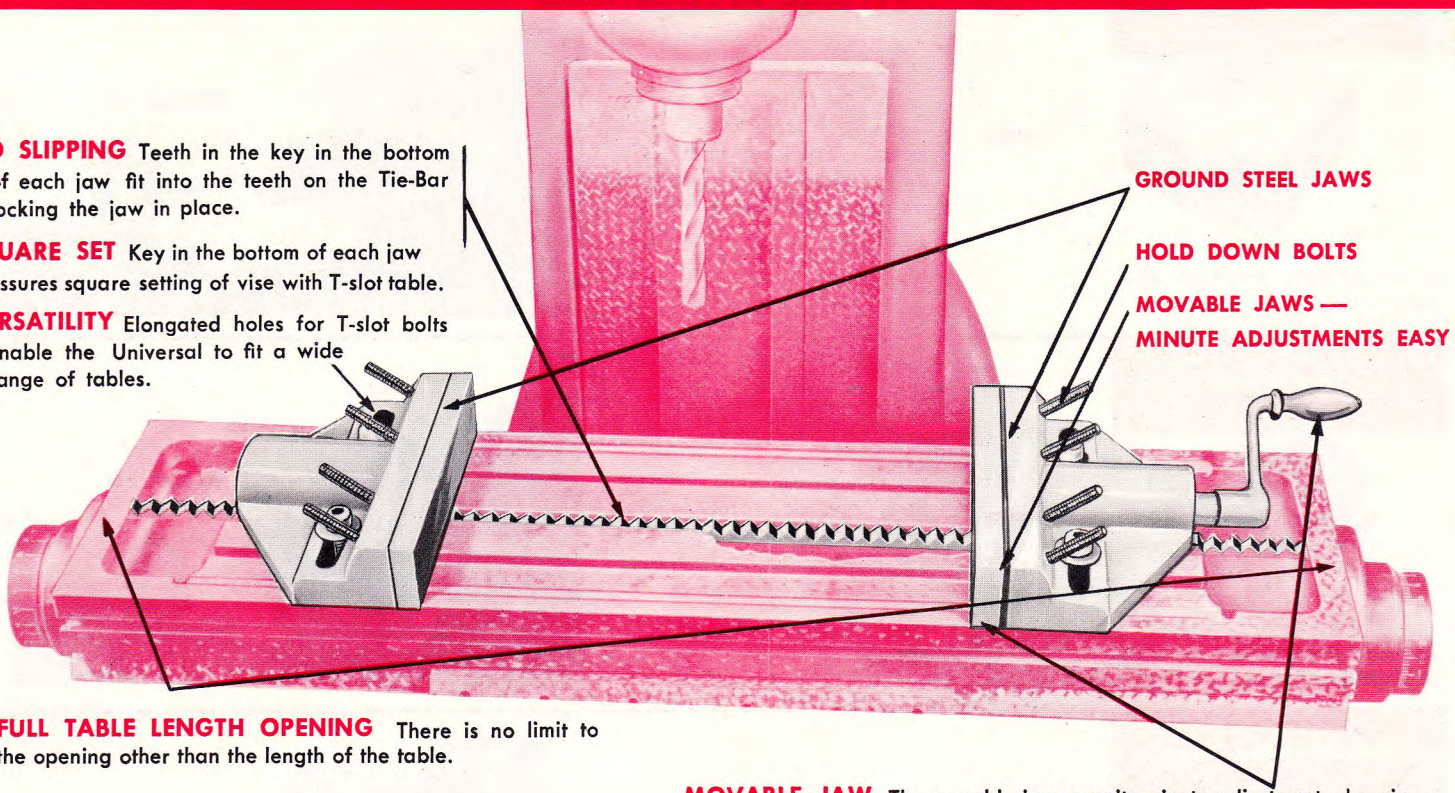
See Back Page for a Partial List of Users of **"UNIVERSAL"** Precision Tools

NO OTHER MILL VISE...OFFERS THESE FEATURES

NO SLIPPING Teeth in the key in the bottom of each jaw fit into the teeth on the Tie-Bar locking the jaw in place.

SQUARE SET Key in the bottom of each jaw assures square setting of vise with T-slot table.

VERSATILITY Elongated holes for T-slot bolts enable the Universal to fit a wide range of tables.

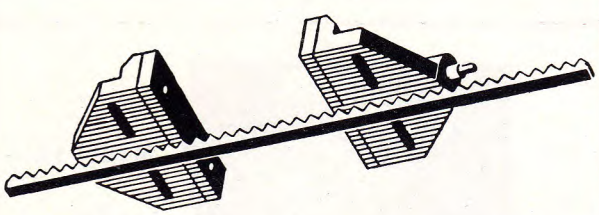


FULL TABLE LENGTH OPENING There is no limit to the opening other than the length of the table.

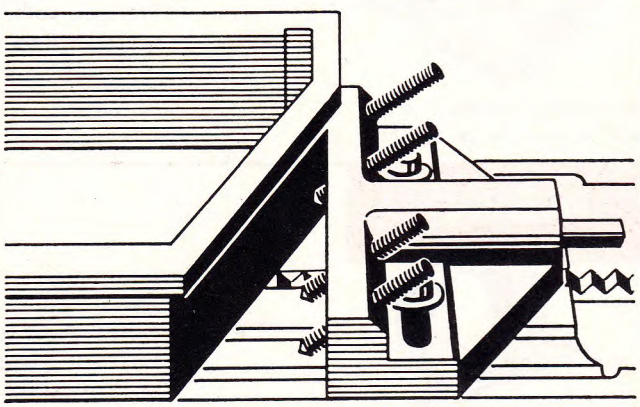
MOVABLE JAW The movable jaw permits minute adjustments, by giving the handle a one half turn after the approximate set up has been made.

You can machine any job on a T-Slot Table with the UNIVERSAL MILL VISE

- In tool shops and mold shops where large blocks must be held rigidly for milling, shaping, grinding, die-sinking, drilling or any machining operation that can be set up on a T-slot table.
- In pattern shops for holding large patterns for machining.
- For production machining on large pieces.
- Standard 36" Tie Bar can be cut to any shorter length or extra length tie bars can be furnished at slight additional cost.



This drawing clearly illustrates the patented locking principle of the Universal Mill Vise. The teeth on the Tie-Bar, which fits into the slot on your T-slot table, mesh perfectly with the teeth in the key on the bottom of each jaw. There can be no slipping when pressure is applied to the work.



JAWS REMOVABLE FOR USE WITH HOLD DOWN BOLTS. (OR INSTALLATION OF SPECIAL JAW PLATES)

SPECIFICATIONS

WIDTH OF JAW — 9" DEPTH OF JAWS — 2½"

Range of distances between holding T-slots — 3¼" to 8¼".

Standard tie bar fits all T- slots ½" or wider.

Price (Standard Model) with any size T-slot keys and 36" Tie-Bar.

Cat. #114 ..... $130.00

Extra "T-Slot" keys, any size. Cat. #114K..... 4.00

Over-length Tie-Bars, any length to 72". Cat. #114T. . Each 10.00

(F.O.B. Parma, Michigan)

ADJUSTABLE PRECISION ANGLE PLATES

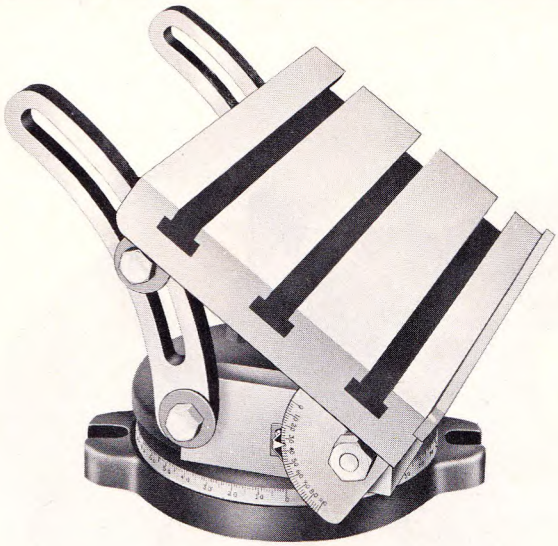
2 STANDARD SIZES

2 TYPES

SAVE SET-UP TIME— "Universal" Compound Angle Plates are saving precious set-up time in plants all over the country. You can use them on all kinds of shop operations, from jig boring to checking. They can be clamped to a lathe face plate or held on a magnetic chuck.

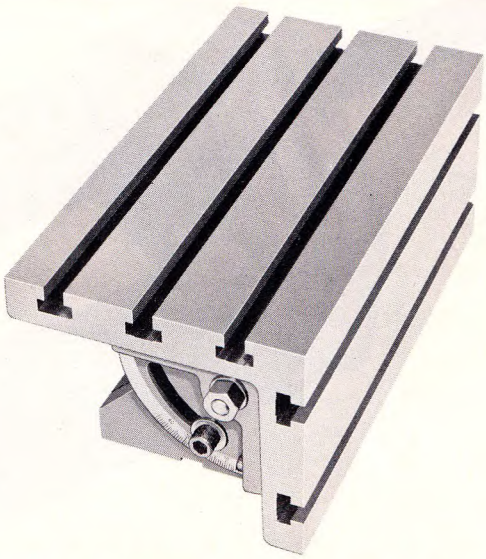
ELIMINATE EXPENSIVE FIXTURES— Used with a simple machine vise, they can handle most angular milling, shaping or drilling jobs, eliminating expensive fixtures on short or varied production runs.

RIGID — ACCURATE — RUGGED— Large heavy bases — oversized slotted arms — accurate engineering and solid construction throughout — insure rigid, non-chatter support for heavy pieces or cuts.



SWIVEL BASE—SINGLE PLATE TYPE

- SWIVEL BASE GRADUATED 0°-360°.
- HEAVY SUPPORT ARMS.
- REMOVABLE STEEL LIP.
- QUADRANT GRADUATED 0°-90°.
- POSITIVE BOLT LOCKING.
- 3 T-SLOTS.
- PROVISION FOR ALIGNING KEYS OF ANY SIZE IN BASE.



PLAIN BASE—DOUBLE PLATE TYPE

- QUADRANT GRADUATED 0°-45°.
- POSITIVE BOLT LOCKING.
- FIVE T-SLOTS.
- HEAVY DUTY.
- FOR TOOL ROOM AND PRODUCTION.
- DOUBLE PLATE DESIGN GIVES 0°-90° ANGLE CAPACITY.
- PROVISION FOR ALIGNING KEYS OF ANY SIZE IN BASE.

CAT. NO. 103
SWIVEL BASE — SINGLE PLATE

Height-Horizontal 5¾"	T-Slot Size ⅝"
With Lip 5¾"	Vertical Adjustment 90°
Without Lip 5½"	Horizontal Adjustment 360°
Length of Plate 12"	Diameter of Base 7¾"
Width of Plate 8"	Weight 68 lbs.

PRICE $135.00
(F.O.B. Parma, Michigan)

CAT. NO. 160
PLAIN BASE — DOUBLE PLATE

Height in Horizontal Position 8½"
Length of Plates 18"
Width of Top Plate 10"
Width of Side Plate 8"
T-Slot Size 11/16"
Vertical Adjustment 0°-45° Top Plate
Vertical Adjustment 45°-90° Side Plate
Weight 180 lbs.

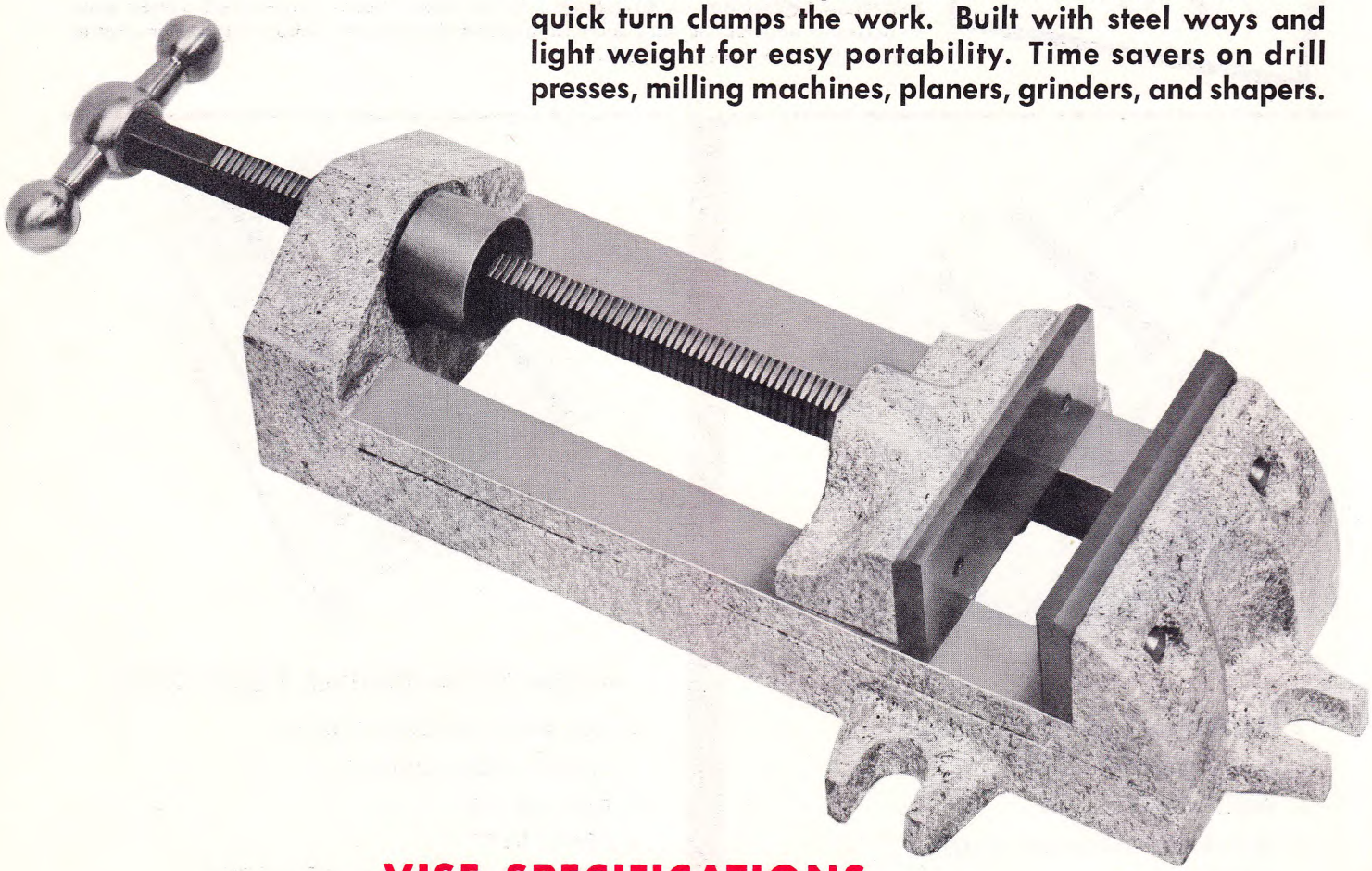
PRICE $275.00
(F.O.B. Parma, Michigan)

LARGER SIZES OF THESE PLATES CAN BE FURNISHED ON SPECIAL ORDER

QUICK ACTING VISES

LIGHTWEIGHT AND PORTABLE

Universal QA Quick Acting Vises have "Push-Pull" Lock and Release. A simple twist of the handle unlocks. A quick turn clamps the work. Built with steel ways and light weight for easy portability. Time savers on drill presses, milling machines, planers, grinders, and shapers.



VISE SPECIFICATIONS

QA 1

Cat. No. 104

Jaw Height	1 ½"
Jaw Width	4"
Jaw Opening	4"
Overall Length	13"
Overall Width	6 ¼"
Overall Height	3 ⅛"
Weight	17 lbs.

PRICE $41.00
(F.O.B. Parma, Michigan)

QA 2

Cat. No. 105

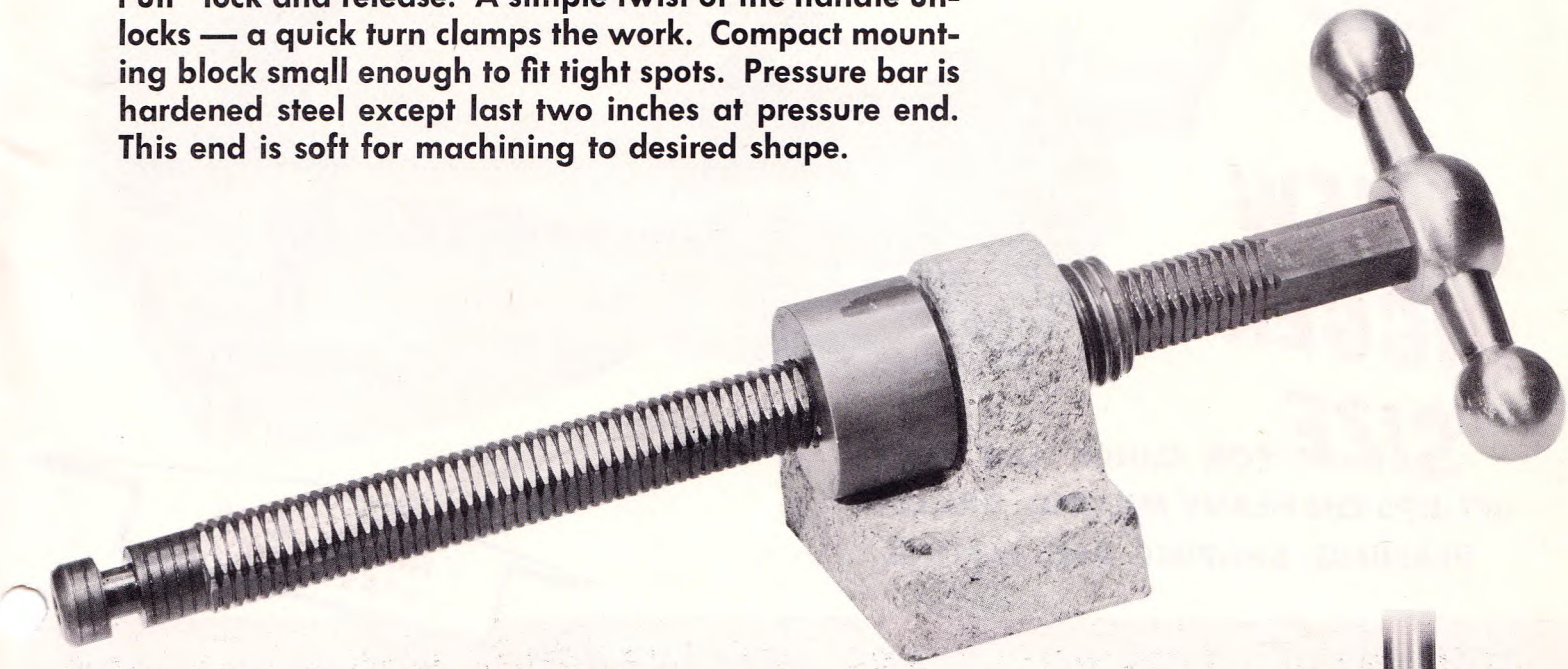
Jaw Height	1 ½"
Jaw Width	4"
Jaw Opening	6"
Overall Length	15"
Overall Width	6 ¼"
Overall Height	3 ⅛"
Weight	19 lbs.

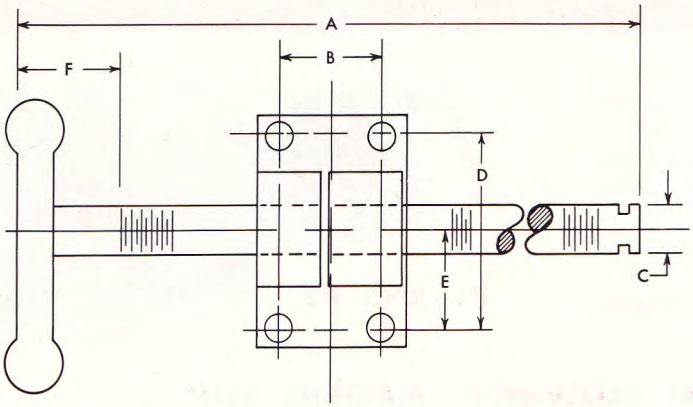
PRICE $46.00
(F.O.B. Parma, Michigan)

QUICK ACTING PRESSURE UNITS

FOR USE WITH JIGS AND FIXTURES

Universal QA Quick-Acting Pressure Units have "Push-Pull" lock and release. A simple twist of the handle unlocks — a quick turn clamps the work. Compact mounting block small enough to fit tight spots. Pressure bar is hardened steel except last two inches at pressure end. This end is soft for machining to desired shape.





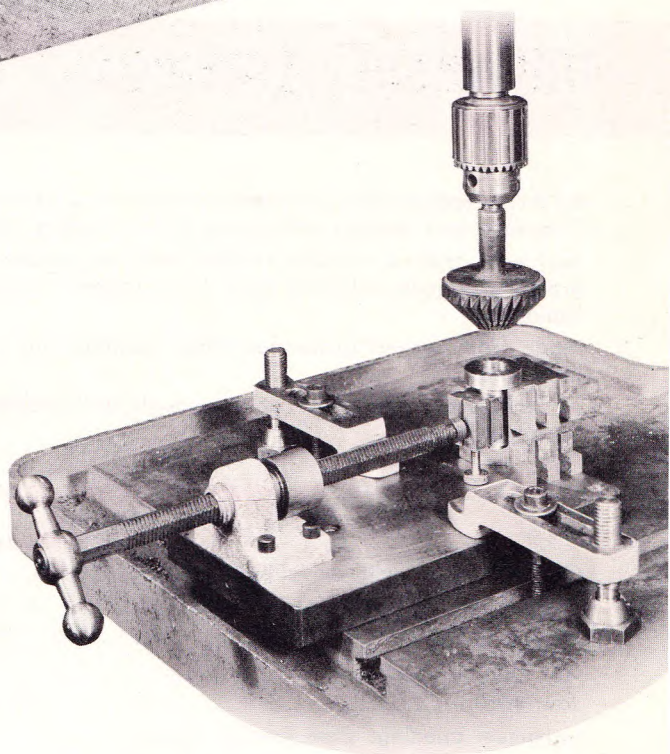
PRESSURE BAR LENGTH OF TRAVEL 8"

PRESSURE UNIT SPECIFICATIONS

CAT. No.	A	B	C	D	E	F	OVER ALL HEIGHT	BASE TO CENTER LINE
210	12"	1 1/4"	5/8" Hex	2 1/4"	1 1/8"	2"	2 3/8"	1 1/2"
211	12"	1 1/4"	5/8" Hex	2 1/4"	1 1/8"	2"	2 1/2"	1 5/8"

CAT. No. 210. . . .$22.00 CAT. No. 211. . . .$23.00

(PRICES F.O.B. PARMA, MICH.)

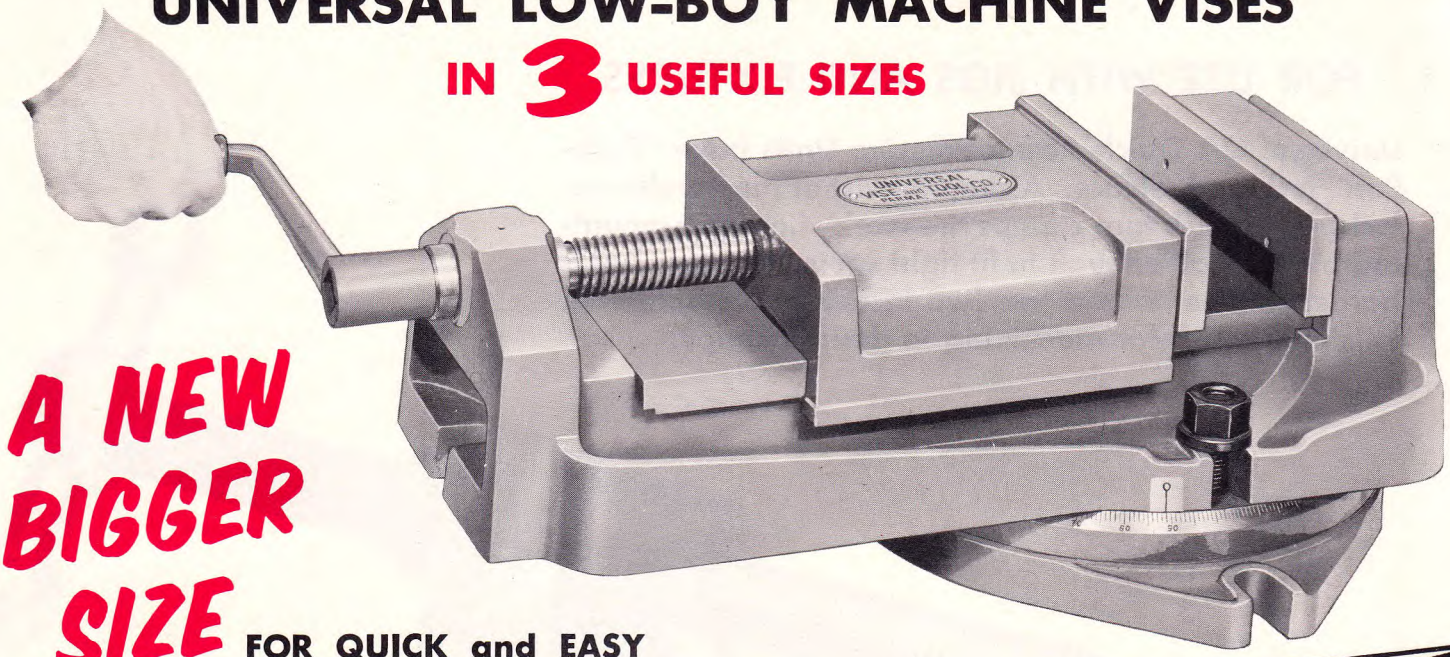


Quick-Acting Pressure Unit used with reaming jig. Note use of Clamp-N-Jacks (See pages 14 thru 21).

A STANDARD...Needed in every shop

UNIVERSAL LOW-BOY MACHINE VISES

IN 3 USEFUL SIZES



A NEW BIGGER SIZE FOR QUICK and EASY SET-UPS ON HEAVY MILLING, DRILLING, PLANING, SHAPING AND BORING.

THE P3 EXTRA HEAVY DUTY

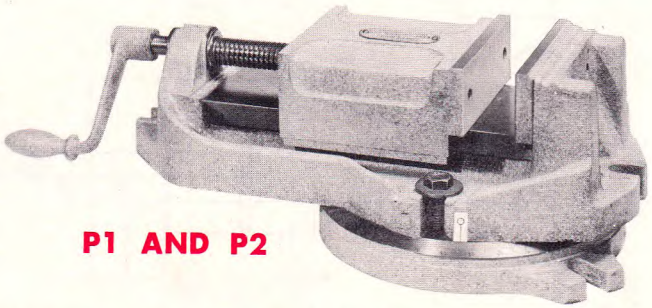
UNIVERSAL "LOW-BOYS" ARE A STANDARD in the Machining Industry

All three Models have low compact construction allowing greater tool clearance and making them more rigid, stronger, for heavy cuts.

Built with ground working surfaces and removable, hardened and ground steel jaws. All have large Acme Screw and Drop Forged Crank Handles.

Made from highest grade semi-steel castings and quality steel and hardware.

All models equipped with coolant trough, and available with or without swivel base.



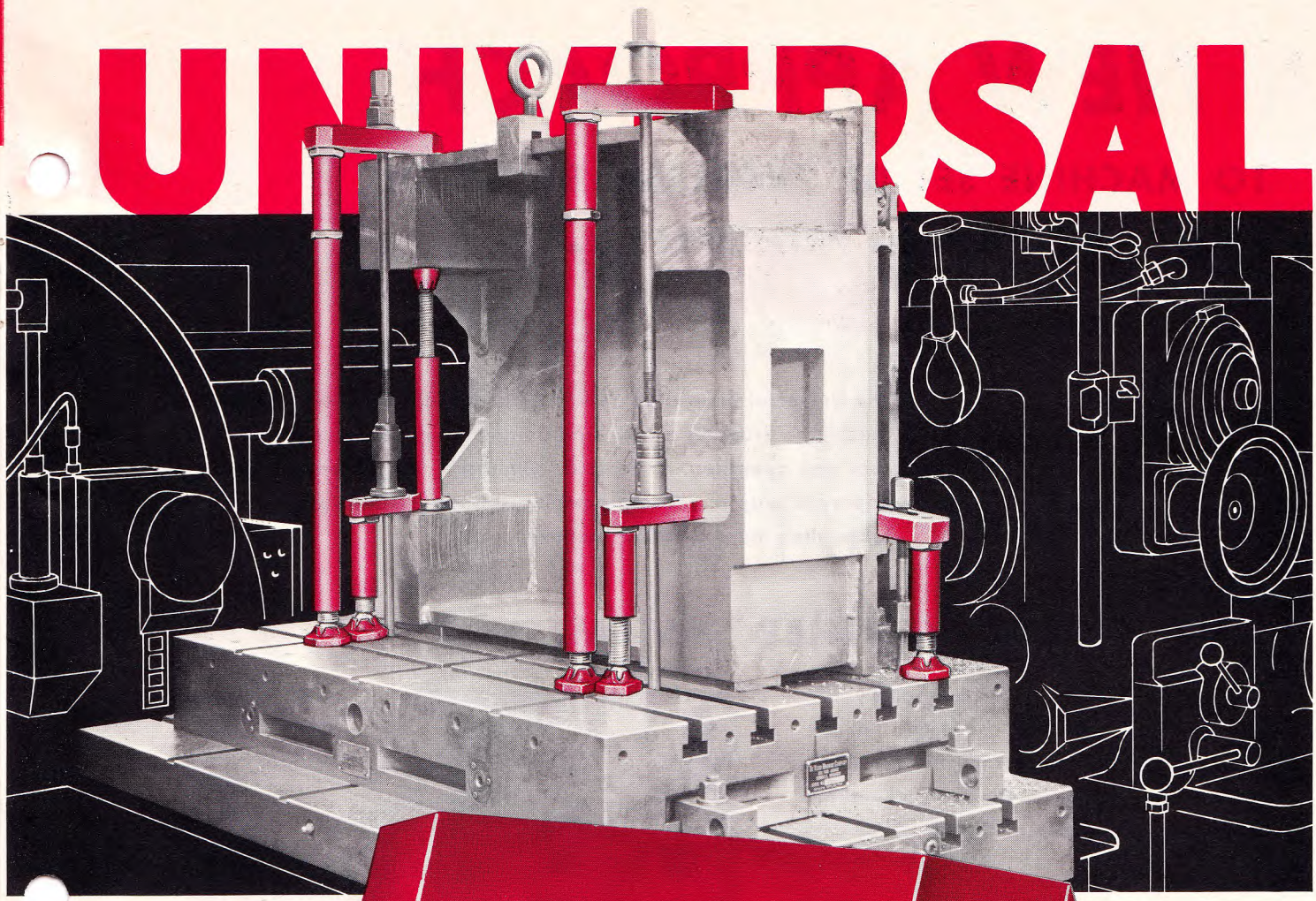
P1 AND P2

SPECIFICATIONS UNIVERSAL "LOW-BOY" MACHINE VISES

	Model P-1	Model P-2	Model P-3
Overall Height, with swivel base	5 1/4"	5 7/8"	7 3/4"
Overall Height, without swivel base	4"	4 1/2"	5 13/16"
Overall Length	13 3/4"	17"	23 1/4"
Jaw Height	1 3/4"	2"	2 1/4"
Jaw Width	4 1/2"	5 1/2"	8 3/4"
Maximum opening, steel jaws in place	3 5/8"	4 5/8"	6 5/8"
Maximum opening, steel jaws removed	4 3/8"	5 5/8"	7 3/4"
Diameter of swivel base	7 5/8"	9 1/4"	12"
Weight, with swivel base	43 lbs.	70 lbs.	194 lbs.
Weight, without swivel base	31 lbs.	55 lbs.	155 lbs.
PRICES: with swivel base	Cat. No. 115 — $63.00	Cat. No. 117 — $79.00	Cat. No. 140 — $198.00
PRICES: without swivel base	Cat. No. 116 — 53.00	Cat. No. 118 — 67.00	Cat. No. 141 — 185.00

PRICES (F.O.B. Parma, Michigan) (If T-Slot Keys are desired please specify T-Slot size)

UNIVERSAL



UNIVERSAL
CLAMP-N-JACK SET-UP SYSTEM

You can reduce set-up time as much as 25% and increase machine production by systematizing set-ups on Boring Mills, Planers, Presses, Drill Presses, and Milling Machines.

FULL DESCRIPTION OF CLAMP-N-JACK IN THE FOLLOWING SPECIAL SECTION.

CLAMP-N-JACK PRICES ARE SHOWN ON PAGE 21.

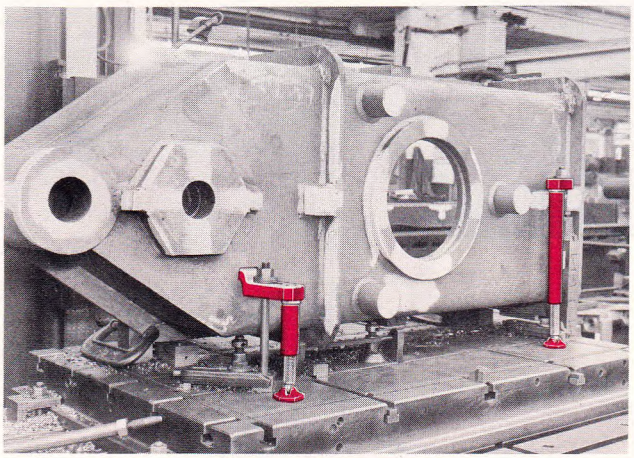
A NEW APPROACH

TO MACHINE SET UP PROBLEMS BASED ON TRIED AND PROVEN PRINCIPLES . . . .

The Universal Integrated Set-Up System brings semi-automation to machine set-ups in a new and unique way, yet is simple in concept and operation. It is not a "gimmick", but a tried and proven improved way of making machine set-ups quicker, and with less labor than by any other method.

NOT LIKE ANY OTHER SYSTEM

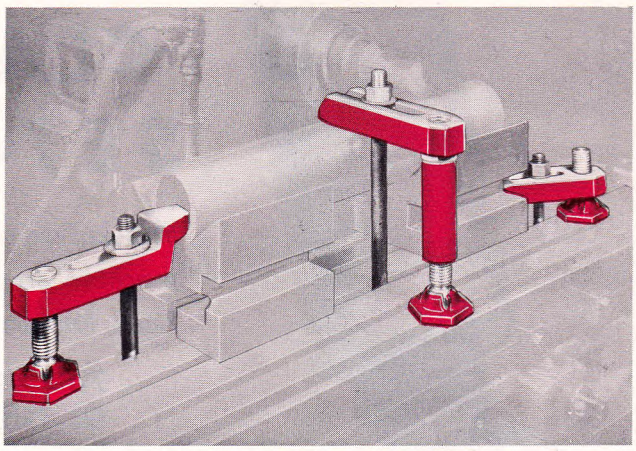
The Universal System is unique in many distinguishing ways. A close examination of the features as described here will offer conclusive and convincing proof as to the superiority of the Universal Integrated Set-Up System.



A TYPICAL BORING MILL SET-UP USING THE UNIVERSAL INTEGRATED SYSTEM.

SAVES LABOR — INCREASES PRODUCTION

It takes substantially less time to clamp a job using the Universal System and the time saved results in increased production from machines and more efficient utilization of shop labor.

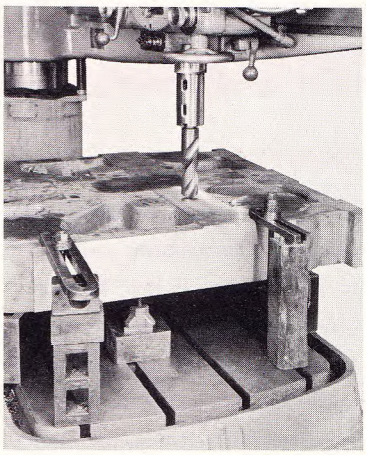


A UNIVERSAL MILLING MACHINE SET-UP.

THE UNIVERSAL INTEGRATED SET-UP SYSTEM WILL SAVE YOU MONEY!

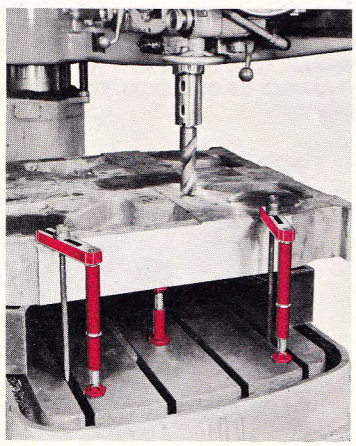
NEW SYSTEM

OBSOLETES "ODD BLOCKS", STEP BLOCKS, AND SHIMS . . . . . .



The problem of clamping work to the table of a machine tool is essentially one of holding the work down by means of a strap through which a T-bolt is placed. It is necessary, then, to support the heel of the strap in such a manner that the strap provides a level and firm gripping surface on the supported piece. Heel supports are usually made of odd blocks of wood or metal which often must be cut to fit each individual job. Shims must be used in many instances to obtain the exact height or length desired. Step blocks are common and sometimes provide the working height desired, but more frequently than not also require shims to meet the needs of the job.

ODD-BLOCK DANGER ELIMINATED WITH SAFER UNIVERSAL SYSTEM



The time consuming task of piling up blocks and shims to provide heel support to the clamping strap is eliminated entirely with the Universal Integrated Set-Up System. The danger of a collapse of such a "toggled-up" support is also done away with with the new Set-Up System, because the strap and heel support are integrated parts. When wood blocks are used there is always the danger of shrinkage, expansion and shifting making it necessary to re-indicate the set-up after relatively short periods. The Universal System eliminates this problem.

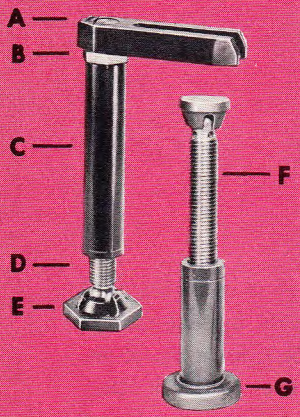
THIS MESS GOES!

GETS RID OF THE CLUTTER

By installing a Universal Integrated Set-Up System, you can do away with the clutter of odd-blocks, step blocks, and shim material that usually surrounds machines.

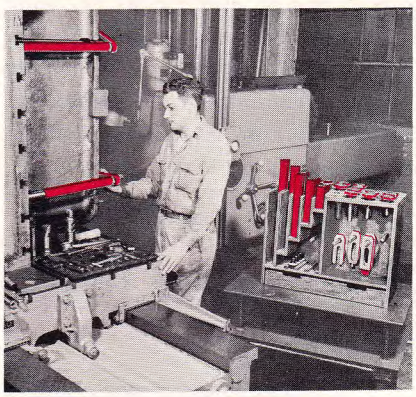
IMPROVE MACHINE EFFICIENCY AND SHOP HOUSEKEEPING WITH UNIVERSAL!

THE UNIVERSAL CLAMP-N-J INFINITELY ADJUSTABLE



The Universal System consists essentially of a series of support tubes, adjustable swivel bases, and couplings by means of which the tubes can be connected together to provide varying and infinitely adjustable strap supports. It also includes straps of several types, each designed to meet a particular clamping problem. These are the standard finger type, straight type, and gooseneck type.

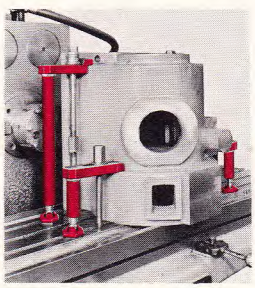
Basic parts of the System are: (A) Strap, (B) Tube Coupling, (C) Support Tube, (D) Ball Screw (E) Swivel Base. Also included in the Universal Set-Up System are (F) Jack Screws and (G) Jack Bases by means of which spacer tubes can be utilized as jacks. T-Bolts, which are usually available in many sizes in most shops, are not included as part of the Set-Up System.



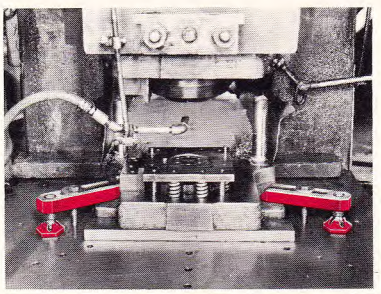
BORING MILL FACE PLATE SET-UP AT M.P. HEINZE CO., CHICAGO. NOTE NEAT APPEARANCE OF UNIVERSAL SYSTEM IN BENCH CABINET.

MAKING A SET-UP WITH UNIVERSAL . . .

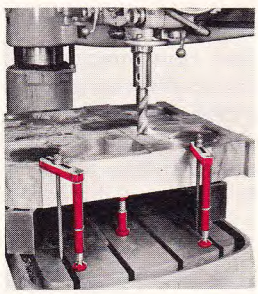
To make a set-up, the set-up man merely selects a tube or tubes, of proper length and swivel base, which together approximate the total height of the clamping job requirement. (If the work is low, he uses only a swivel base of proper length.) He then selects the strap he needs, adjusts the strap to the correct height by means of the screw on the swivel base, places a T-bolt through the slot in the strap and tightens nut on the bolt until clamping is completed. It has not been necessary for him to look for "odd blocks" of proper size, find tools and make blocks or locate shims and make-shift supports of any kind. The result is a set-up which gives him the exact height he needs.



A MILLING MACHINE SET-UP.

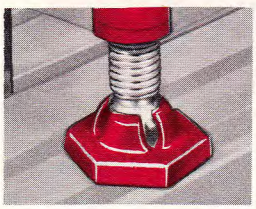


A PUNCH PRESS SET-UP AT GENERAL STAMPING CORP., JACKSON, MICHIGAN.



A RADIAL DRILL PRESS SET-UP.

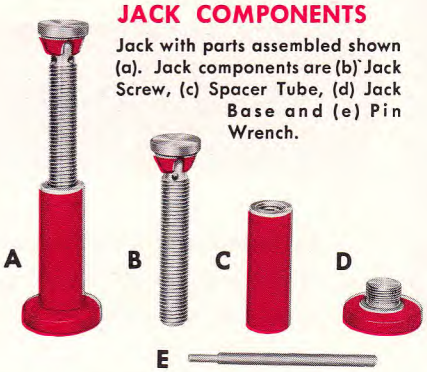
SWIVEL BASE PROVIDES SOLID FOOTING . . . PROTECTS MACHINE TABLE



Any deviation from level which may occur as clamping is completed is fully compensated for by the swivel base and its ball-joint support. The swivel base also remains perfectly flat on the machine table and not only provides a slip-proof footing for the support but also prevents damage to the machine table itself.

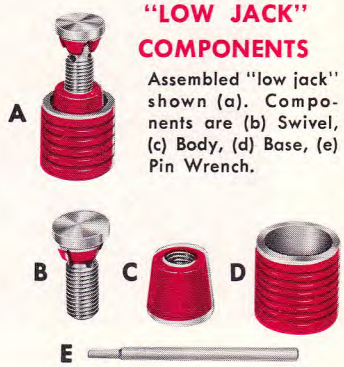
JACK COMPONENTS

Jack with parts assembled shown (a). Jack components are (b) Jack Screw, (c) Spacer Tube, (d) Jack Base and (e) Pin Wrench.



"LOW JACK" COMPONENTS

Assembled "low jack" shown (a). Components are (b) Swivel, (c) Body, (d) Base, (e) Pin Wrench.



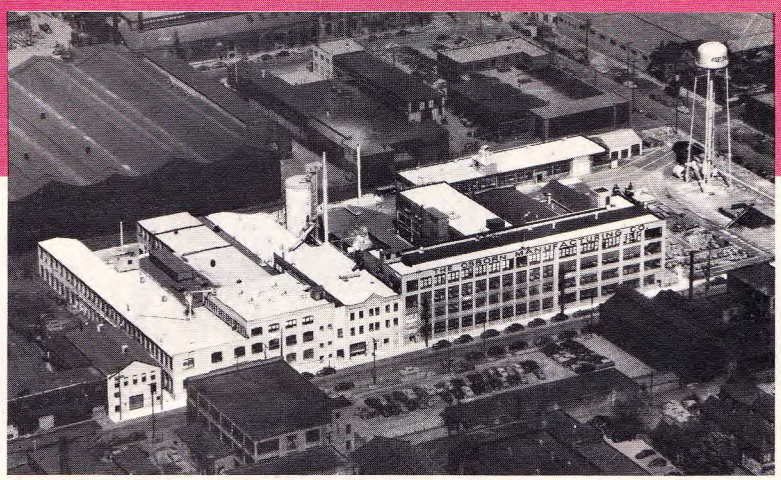
PROFIT FROM THE EXPERIENCE OF OTHERS BY INSTALLING

ACK SET-UP SYSTEM FOR POSITIVE CLAMPING

Proof of Superiority . . .

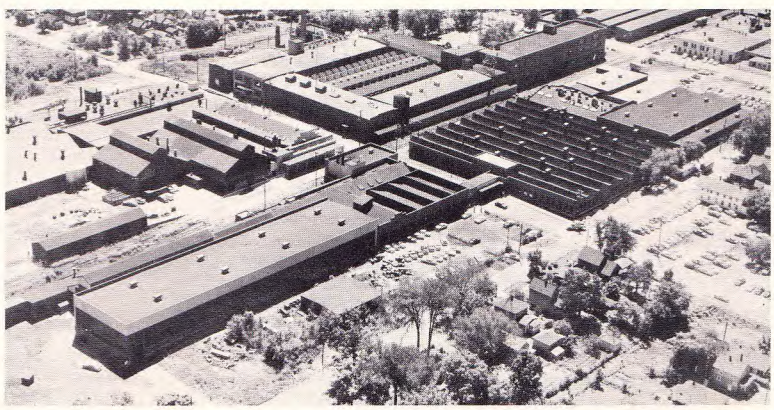
USER CLAIMS 25% SAVINGS IN SET-UP TIME WITH UNIVERSAL SYSTEM

Wherever Universal Systems are used, savings invariably result. For instance, Mr. Carl Brueggemeyer of the Osborn Manufacturing Company, large Cleveland producer of foundry and industrial brushing equipment reports: "Now that we are using the Universal System, we find that a typical set-up takes 25% less time than our previous method. When you consider that about 30% of boring mill time in a shop such as ours is set-up time, you can see that we are gaining approximately 7 or 8 percent in machine production time. On a $15 to $20 per hour machine, this saving really counts up. We feel that the Universal System has paid for itself many times over."



CLAMP-N-JACK SPEEDS SET-UPS IN STAMPING AND PUNCH PRESS PLANTS

A typical comment is the one received from Mr. Angelo Comito, Production Superintendent at the Hancock Mfg. Co., Jackson, Michigan, prominent manufacturer of high volume auto parts, stampings and Telecontrol Production Control Equipment. Mr. Comito says: "We use the Universal Clamp-N-Jack System throughout our press room for die set-ups. We save time and make better set-ups. It is no longer necessary for our set-up men to spend time looking for proper blocks and clamps. They are all right there in the Clamp-N-Jack System."



HEINZE CO. MODERNIZES WITH UNIVERSAL

In preparation for its 25th anniversary, the M. P. Heinze Machine Co., prominent special machinery builder in Chicago, completed a half-million dollar machine replacement and modernization program. Included are the latest in Automatic Positioning Horizontal Boring Mills. George Heinze, president of this forward moving firm says: "We would not consider our program complete without a Universal Set-Up System for every new machine tool. Universal helps us to get the most out of our new equipment."

These are only three of many favorable comments which are received daily.

UNIVERSAL SYSTEMS IN YOUR PLANT OR SHOP TODAY!

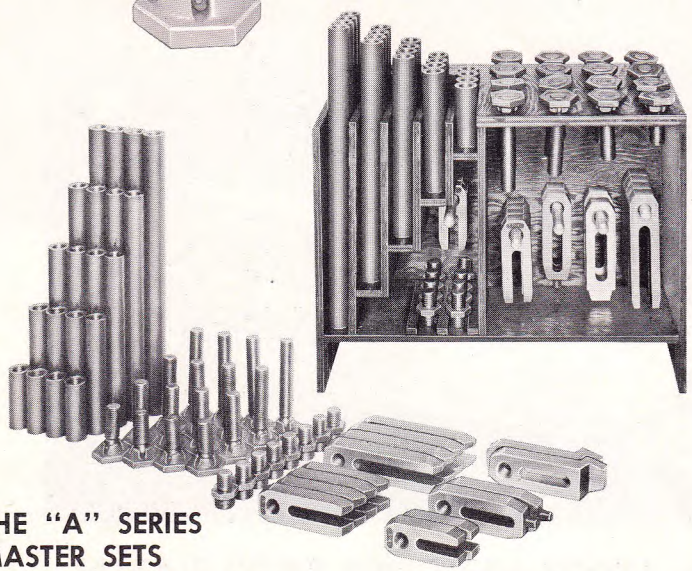
CLAMP-N-JACK "A" SERIES FOR LARGER JOBS

"A" Series for Larger Jobs. Compare part size with illustration of "B" Series on opposite page.

Components for the Universal Integrated Set-Up System have been selected for "packaged" sets. The "Master Set" and "Utility Set" differ only in the number of component parts included in each. Each set is furnished in a bench cabinet of heavy duty plywood and parts are arranged so that they can be selected quickly and with ease.

ALL PARTS PRECISION-MADE AND STURDY

- Straps have ground contact surfaces to insure rigid set-ups and are heat treated to high Rockwell for long wear and maximum strength.
- Spacer tubes are heavy wall 1½" diameter mandrel drawn steel tubing.
- Swivel Bases are high grade sturdy malleable castings, with 1" diameter steel screws.
- All other parts of highest grade steels.
- Parts brightly painted for easy visibility and location.

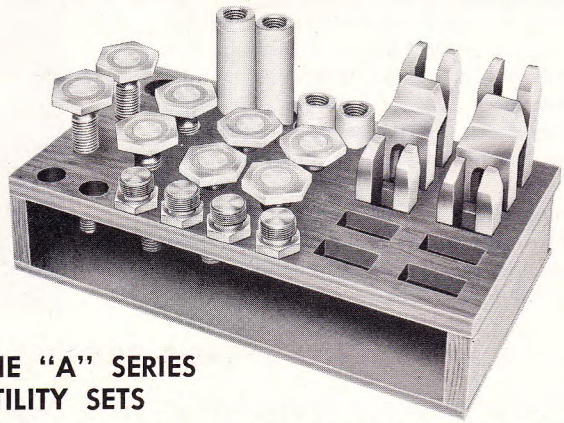


THE "A" SERIES MASTER SETS

For use with boring mills, larger milling machines, radial drill presses, planers, etc., for clamping heights of 0" — 50".

	MSA MASTER SET For Use with T-slot Bolts ½" to ⅞" dia.	MSA-1 MASTER SET For Use with T-slot Bolts ⅞" — 1" dia.
Spacer Tubes	4 each 4", 8", 12", 16" and 20"	4 each 4", 8", 12", 16" and 20"
Swivel Bases	4 each 2", 3", 4" and 5"	4 each 2", 3", 4" and 5"
Tube Couplings	8	8
Straps	2 each 4¾" straight 4 each 6" straight 4 each 8" straight 2 each 8" gooseneck 2 each 7" Finger-type	6 each 8" straight 4 each 12" straight 2 each 8" gooseneck 2 each 7" finger

Both Master Sets equipped with Bench Rack with space for extra straps, tubes and couplings.

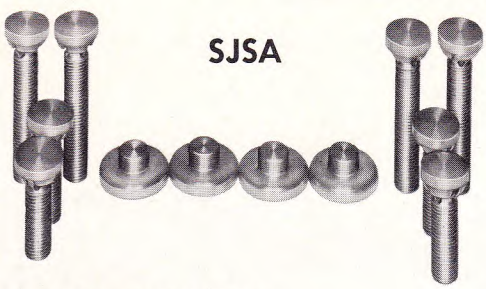


THE "A" SERIES UTILITY SETS

For use with medium and smaller milling machines, drill presses, punch presses, etc., for clamping heights of 0" — 12"

	USA UTILITY SET For Use with T-slot Bolts ½" to ⅞" dia.	USA-1 UTILITY SET For Use with T-slot Bolts ⅞" — 1" dia.
Spacer Tubes	2 each 4" and 8"	2 each 4" and 8"
Swivel Bases	2 each 2", 3", 4" and 5"	2 each 2", 3", 4" and 5"
Tube Couplings	4	4
Straps	2 each 4¾" straight 2 each 6" straight 2 each 8" gooseneck	2 each 6" straight 2 each 8" straight 2 each 8" gooseneck

Both Utility Sets equipped with Bench Rack with space for extra straps, tubes and couplings.



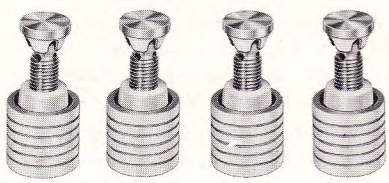
SJSA

THE STANDARD JACK SET*

The Standard Jack Set consists of the following components:

Jack Bases: 4
Jack Screws: 4 each 3"
4 each 5"
Pin Wrench: 1
*NOTE: Spacer tubes not included.

LJSA



THE LOW JACK SET

The Low Jack Set consists of the following components:

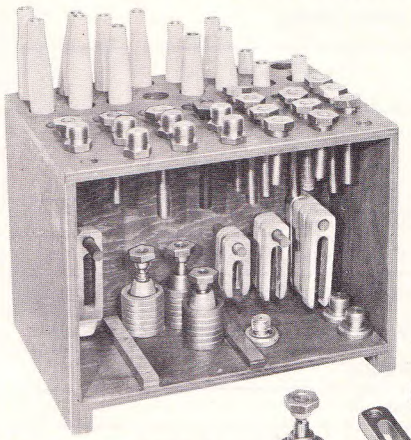
Jack Bases: 4
Jack Bodies: 4
Jack Screws: 4
Pin Wrench: 1

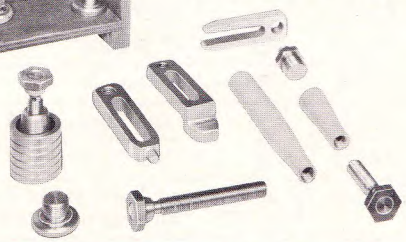
CLAMP-N-JACK "B" SERIES FOR SMALLER JOBS

"B" Series for smaller jobs. Compare part size with illustration of "A" Series part on opposite page.

Smaller clamping or jacking set-ups on milling machines, boring mills, planers, drill presses and punch presses are easy, quick and accurate with "B" Series Clamp-N-Jack. Smaller sized parts of Clamp-N-Jack "B" Series take studs up to ½" diameter. Convenient sets are low cost and pay for themselves by eliminating hazards of step blocks, teetery columns of odd blocks and odd-ball set ups that cause accidents and scrap.

- Clamping range from 0" to approximately 30"
- Spacer tubes are seamless C1018 steel—1⅛" O.D., 15/16" I.D.
- Swivel Bases, Couplings, Jack Bases and Low Jacks are all B1113 cold rolled steel, hardened.
- Straps have ground contact surfaces to insure rigid set-ups and are heat treated to high Rockwell for long wear and maximum strength.
- All screws and couplings are heat treated to a hardness of 50 Rockwell C.
- Straps are carburized and hardened—48-52 Rockwell C.

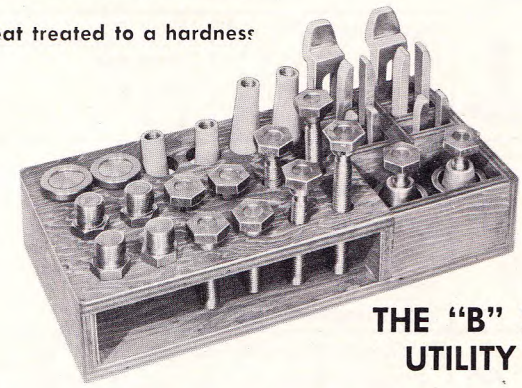




THE "B" SERIES MASTER SET

THE MASTER "B" SERIES SET — MSB	
Spacer Tubes	4 ea. 3", 5", 7" and 9"
Straps	2 ea. 3" straight 3 ea. 4" straight 4 ea. 5" straight 2 ea. 5" gooseneck 1 ea. 5" finger
Tube Couplings	8 each
Swivel Bases	4 ea 3", 4", and 5"
Standard Jack Bases, Jack Screw and Pin Wrench	4 each
Low Jacks with Jack Screw and Pin Wrench	4 each
Bench Cabinet	1 each

Bench cabinet has space for extra straps, tubes and couplings.



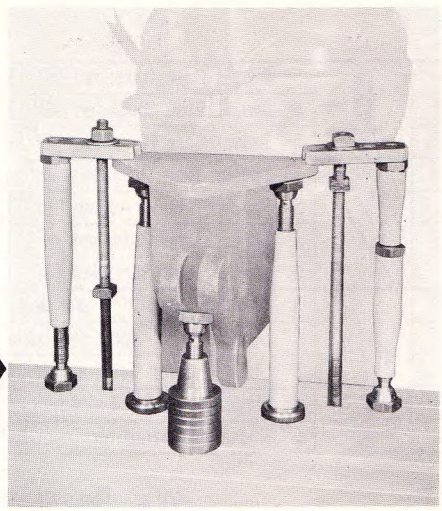
THE "B" SERIES UTILITY SET

THE UTILITY "B" SERIES SET — USB	
Spacer Tubes	2 ea. 3" and 5"
Straps	2 ea. 3" straight 2 ea. 5" straight 2 ea. 5" gooseneck
Tube Couplings	4 each
Swivel Bases	2 ea. 3", 4", and 5"
Standard Jack Bases, Jack Screw and Pin Wrench	2 ea.
Low Jacks with Jack Screw and Pin Wrench	2 ea.
Bench Rack	1 ea.

Bench Rack has space for extra straps, tubes and couplings.

A typical set-up using clamps and jacks—note use of swivel base only at right.

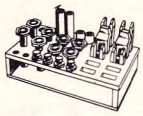
For greater reach — use longer tubes or combinations.



ALL PARTS MAY BE ORDERED SEPARATELY

SEE PART NUMBERS AND PRICES NEXT PAGE

CLAMP-N-JACK "A" SERIES PRICE LIST

MODEL NO.	COMPLETE SETS	DESCRIPTION	LIST PRICE EACH
MSA		Master Set — Accommodates T-slot bolts ½"-⅞" — complete with bench cabinet	$270.00
MSA-1		Master Set — Accommodates T-slot bolts ⅞"-1" — complete with bench cabinet	330.00
USA		Utility Set — Accommodates T-slot bolts ½"-⅞" — complete with bench cabinet	115.00
USA-1		Utility Set — Accommodates T-slot bolts ⅞"-1" — complete with bench cabinet	165.00
SJSA		Standard Jack Set — Complete with drawer to fit Master Set bench cabinet	65.00
LJSA		Low-Jack Set	65.00

PART NO.	PARTS	DESCRIPTION	LIST PRICE EACH
A-2-SB		Swivel Base — 0"-2" 1"-8 Thread size	$ 4.50
A-3-SB		Swivel Base — 0"-3" 1"-8 Thread size	4.50
A-4-SB		Swivel Base — 0"-4" 1"-8 Thread size	4.50
A-5-SB		Swivel Base — 0"-5" 1"-8 Thread size	4.50
A-4-T		Spacer Tube — 4" Length 1½" Diameter	4.90
A-8-T		Spacer Tube — 8" Length 1½" Diameter	4.90
A-12-T		Spacer Tube — 12" Length 1½" Diameter	4.90
A-16-T		Spacer Tube — 16" Length 1½" Diameter	4.90
A-20-T		Spacer Tube — 20" Length 1½" Diameter	6.90
		Longer lengths available on special order.	
A-44-S		4¾" Straight Strap—For T-slot bolts ½"-⅞" dia.	9.00
A-46-S		6" Straight Strap—For T-slot bolts ½"-⅞" dia.	9.00
A-46-S-1		6" Straight Strap—For T-slot bolts ⅞"-1" dia.	13.00
A-48-S		8" Straight Strap—For T-slot bolts ½"-⅞" dia.	9.00
A-48-S-1		8" Straight Strap—For T-slot bolts ⅞"-1" dia.	13.00
A-52-S-1		12" Straight Strap—For T-slot bolts ⅞"-1" dia.	19.00

PART NO.	PARTS	DESCRIPTION	LIST PRICE EACH
A-47-F		7" Finger Strap—For T-slot bolts ½"-⅞" dia.	$10.00
A-47-F-1		7" Finger Strap—For T-slot bolts ⅞"-1" dia.	16.00
A-48-G		8" Gooseneck Strap—For T-slot bolts ½"-⅞" dia.	10.00
A-48-G-1		8" Gooseneck Strap—For T-slot bolts ⅞"-1" dia.	16.00
A-60-TC		Tube Coupling	2.50
A-71-JB		Jack Base	4.50
A-73-JS		3" Jack Screw — 1"-8 Thread size	6.50
A-75-JS		5" Jack Screw — 1"-8 — Thread size	6.50
A-90-LJ		3"-6" Low Jack Set (Swivel, body, base and pin wrench) (Not sold by individual parts)	17.00
	CASES		
A-1-C		Bench Cabinet for Master Sets (MSA — MSA-1)	34.00
A-1-R		Bench Rack for Utility Sets (USA — USA-1)	18.00

CLAMP-N-JACK "B" SERIES PRICE LIST

MODEL NO.	COMPLETE SETS	DESCRIPTION	LIST PRICE EACH
MSB		Master Set — Accommodates T-slot bolts up to ½" dia. — complete with cabinet	$205.00
USB		Utility Set — Accommodates T-slot bolts up to ½" dia. — complete with rack	90.00

PART NO.	PARTS	DESCRIPTION	LIST PRICE EACH
B-3-SB		3" Swivel Base (threaded ⅝"-11)	$ 3.50
B-4-SB		4" Swivel Base (threaded ⅝"-11)	3.50
B-5-SB		5" Swivel Base (threaded ⅝"-11)	3.50
B-3-T		3" Spacer Tube (threaded ⅝"-11, 1"-14)	2.75
B-5-T		5" Spacer Tube (threaded ⅝"-11, 1"-14)	2.75
B-7-T		7" Spacer Tube (threaded ⅝"-11, 1"-14)	2.75
B-9-T		9" Spacer Tube (threaded ⅝"-11, 1"-14)	2.75
B-43-S		3" Straight Strap for T-slot bolts to ½" dia.	5.00
B-44-S		4" Straight Strap for T-slot bolts to ½" dia.	5.00
B-45-S		5" Straight Strap for T-slot bolts to ½" dia.	5.00
B-45-F		5" Finger Strap for T-slot bolts to ½" dia.	6.00
B-45-G		5" Gooseneck Strap for T-slot bolts to ½" dia.	6.00

PART NO.	PARTS	DESCRIPTION	LIST PRICE EACH
B-60-TC		Tube Coupling (threaded ⅝"-11, 1"-14)	$ 2.50
B-71-JB		Standard Jack Base (threaded 1"-14)	3.00
B-73-JS		3" Standard Jack Screw with Pin Wrench (threaded ⅝"-11)	3.50
B-75-JS		5" Standard Jack Screw with Pin Wrench (threaded ⅝"-11)	3.50
B-90-LJ		Low Jack with Pin Wrench (Including B-73-JS, 3" Jack Screw)	7.00
	CASES		
B-1-C		Bench Cabinet for MSB Master Set	30.00
B-1-R		Bench Rack for USB Utility Set	11.00

We Reserve Right to Change Prices Without Notice

Manufactured By

UNIVERSAL VISE & TOOL COMPANY • PARMA, MICHIGAN

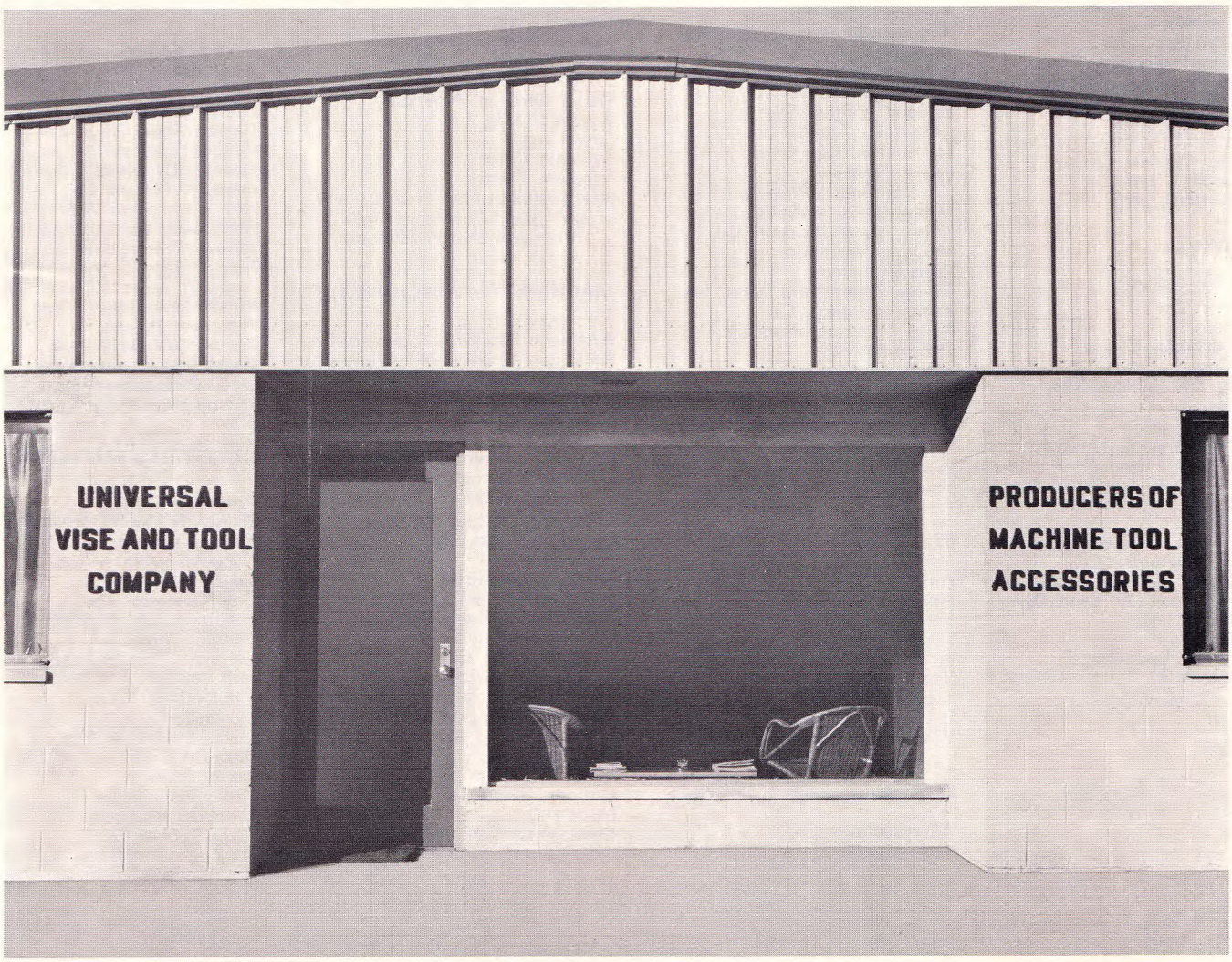
UNIVERSAL VISE AND TOOL COMPANY

PARMA, MICHIGAN

JE 1-4435

WHEN YOU WANT TO CUT
YOUR TOOLING AND SET UP COSTS
THINK OF

UNIVERSAL.....



.....NEARLY EVERYBODY DOES!

UNIVERSAL PRODUCTS ARE USED BY ALMOST

EVERY MAJOR METAL WORKING MANUFACTURER

PARTIAL LIST of USERS of "UNIVERSAL" Vises, Angle Plates & Fixtures

This list represents only a very small percentage of the more than 10,000 leading manufacturers all over the world who use "Universal" products.

AVIATION

A. G. A. Aviation Corp.
Bell Aircraft Co.
Bendix Aviation Corp.
Cessna Aircraft
Curtiss-Wright Corp.
Fairchild Aviation
Hughes Tool, Aircraft Strut Div.
Glenn L. Martin Co.
Mercury Aircraft
Naval Aircraft Factory, Phila.
North American Aviation, Inc.
Pratt & Whitney Aircraft
Ranger Aircraft Corp.
Sacramento Air Depot—War Dept.
Taylorcraft Aviation Corp.
Vultee Aircraft, Inc.
Warner Aircraft Corp.

AUTOMOTIVE

American Motors Corp.
Borg-Warner Corp.
Cannon Mfg.
Carter Carburetor Corp.
Chrysler Corp.
Eaton Mfg. Div. Wilcox-Rich
Ford Motor Co.
Gar Wood Industries
General Motors Corp. Divisions
- A. C. Spark Plug—Aero Products
- Buick Motor—Cadillac Motor
- Chevrolet—Detroit Diesel
- Fisher Body
- G. M. Truck & Coach
- Harrison Radiator
- New Departure—Oldsmobile

Libby-Owens-Ford, Aviation Div.
Motor Wheel Corp.
Reo Motors Inc.
Studebaker-Packard Corp.
White Motor Co.
Willys-Overland Motors

RAILROADS

Baldwin Locomotive Works
Illinois Central R. R.
New York Central
Southern Pacific R. R.
United Traction, Albany

METAL PRODUCTS

Aluminum Co. of America
American Brake Shoe & Foun'y Co.
American Brass Co.
American Can Co.
American Radiator & S.S.Corp.
American Stove Co.
Babcock & Wilcox Tube Co.
Bell & Howell Co.
Bridgeport Brass Co.
Caterpillar Tractor Co.
Continental Can Co.
Crane Company
General Fireproofing Co.
International Nickel Co.
Kaiser Metal Products Co.
McQuay-Norris Co.
Reed & Barton
Revere Copper and Brass, Inc.
Reynolds Metals Co.
Ruud Manufacturing Co.
SKF Industries
Sperry Gyroscope Co.
Teletype Corp.
Toledo Scale
U. S. Aluminum Co.
Underwood Corp.
Worthington Pump & Machinery
Youngstown Steel Car Corp.

STEEL

American Steel & Wire Co.
Atlantic Steel
Bethlehem Steel Co.
Inland Steel Co.
Pittsburgh Steel Co.
Republic Steel Co.
Truscon Steel Co.
U. S. Steel Corp.
Wheeling Steel Corp.

ELECTRICAL — ELECTRONICS

Allis Chalmers Co.
Anaconda Wire & Cable Co.
Apex Electrical Mfg. Co.
Crosley Corp.
Easy Washing Machine Co.
Electric Auto-Lite Co.
Electrolux Corp.
Emerson Electric Co.
General Cable Corp.
General Electric Co.
General Electric X-Ray Corp.
Howell Electric Motors Co.
New Haven Clock Co.
Philco Corp.
Radio Corp. of America
Raytheon Mfg. Co.
Servel Inc.
Sylvania Corp.
Western Electric Co.
Westinghouse Elec. & Mfg. Corp.
- Springfield Baltimore Lima
- Pittsburgh Sharon Sunbury

MACHINERY — MACHINE TOOLS

American Laundry Machinery Co.
American Machine & Foundry Co.
American Machine & Metals, Inc.
E. W. Bliss Co.
S. F. Bowser Co.
Bullard Co.
Burroughs Adding Machine Co.
Chicago Pneumatic Tool Co.
Cincinnati Bickford Tool Co.
Cincinnati Milling Machine Co.
Cushman Chuck Co.
A. B. Dick Co.
De Laval Separator Co.
De Laval Steam Turbine Co.
General Machinery Corp.
Gisholt Machine Co.
Ingersoll-Rand Co.
Jeffrey Manufacturing Co.
John Deere Co.
Kearney & Trecker Corp.
R. K. Le Blond Machine Tool Co.
Link Belt Co.
Mesta Machine Co.
National Acme Co.
Norton Co.
Oliver Farm Equipment Co.
Reed Roller Bit Co.
Saco-Lowell Shops
F. J. Stokes Machine Co.
Textile Machine Works
Vickers, Inc.
V&O Press Co.
Walworth Co.
Warner & Swasey Co.
Westinghouse Air Brake Co.

NAVY YARDS — SHIPYARDS — ARSENALS

Alabama Dry Dock
Corozal Post, Canal Zone
General Engineering
General Dynamics Corp.
Hercules Powder Co.
Key West Naval Station
Manitowoc Shipbuilding Co.
Matson Navigation Co.
New London Submarine Base
Newport News Shipbuilding
Philadelphia Navy Yard
Picatinny Arsenal
Portsmouth Navy Yard
Puget Sound Navy Yard
U. S. Ordnance—Fla.
Washington Navy Yard

INDUSTRIAL SPECIALTIES

American Optical Co.
Bausch & Lomb Optical Co.
Celotex Corp.
Congoleum-Nairn, Inc.
Continental Oil Co.
Dow Chemical Co.
Firestone Tire & Rubber Co.
General Mills
Goodyear Tire & Rubber Co.
Gulf Oil Co.
Liquidometer Corp.
Masonite Corp.
Minn. & Ontario Paper Co.
Ohio Oil Co.
Pacific Mills
Parke Davis & Co.
Pepperell Mfg. Co.
U. S. Rubber Co.

Litho in U. S. A.

ORDER YOUR "UNIVERSAL" TOOLS TODAY . . . SOLVE YOUR SET-UP PROBLEMS